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The profits for the year were \$3,896,884. The deficit of Aug. 18, 1898, \$1,840,761, being deducted from this, leaves a net of \$2,056,123; \$371,638 provided for interest on debentures, and current dividend on preferred stock. The accrued dividends on preferred stock, amounting to \$1,527,914, were paid, leaving a



surplus of a little over \$156,000. The heroic reduction of nominal assets and obligations, together with the great prosperity of the year, have now brought the General Electric within sight of dividends on the common stock.

The report of the Second Vice-President, Gen. Eugene Griffin, shows the operations of the sales department. The total sales billed to customers during the year were \$15,679,000, showing a profit on sales of \$2,585,000. The orders increased 21 per cent. as compared with the year before, and the increase in apparatus orders was 52 per cent. The orders received during the year amounted to \$17,431,327. The largest business was done of any fiscal year since the organization of the company.

Gen. Griffin calls especial attention to the business of the utilization of water powers by electrical transmission, which was a marked feature of the year. A list is given of a few of the more important transmission plants which have been sold by the company. The longest of these is that at Los Angeles, Cal., where power is transmitted 80 miles at 33,000 volts. The Provo installation transmits 40 miles at 40,000. There are nine installations in this list transmitting power 20 miles or over, and in a list of 24 water power plants only three transmit at less than 10,000 volts; but we are told that the company has yet to learn of a fatal accident resulting from the use of high voltages. Altogether the company has in operation about 40 long distance transmission plants, employing potentials of from 10,000 to 40,000 volts.

The entire works of the company now cover 41.3 acres enclosed, and 9,000 persons are employed.

#### Long Island Railroad Improvements.

The improvements which have recently been made, or are proposed for the betterment of the Long Island Railroad, will cost about a million dollars. The most important part of the plans is in connection with the Atlantic avenue improvements and the proposed tunnel under the East River, connecting City Hall, Brooklyn, with Cortlandt street, New York.

The measure granting the right to build an electric line over the depressed tracks on Atlantic avenue when the proposed improvements shall have been made, has passed both houses at Albany and is now before the Governor. After considerable discussion over the question of a perpetual franchise for a tunnel railroad, Senator Marshall's Long Island tunnel bill has been amended, limiting the franchise to 50 years with the privilege of an extension of 25 years, and last week this bill passed both houses and now awaits the signature of the Governor.

The accompanying map, Fig. 1, shows the lines of the Long Island Railroad and some other features in connection with the improvements. The tunnel part of the scheme provides for an underground road along a route shown by the heavy black line from New York to Flatbush avenue station, marked E. From E to D (that is, to Nostrand avenue) the tracks will be depressed. They will then pass to an elevated structure as far as C, where the tracks will again be depressed to East New York and run over an elevated structure from the point marked B to A, where they will come to the level of the Long Island road, as shown. The elevations of the land along the route of this part of the work is shown in Fig. 2. It will be seen by an examination of this profile that the elevations and depressions in the tracks mentioned are necessary for an economical construction of the road along the route.

The connection of the Long Island road with the Myrtle avenue elevated line, as shown on the map, has not been made, except to complete the grading, so that tracks can be laid when required. There has been no demand for this connection up to the present time. The connection with the Brooklyn Elevated at A has been referred to at some length in previous issues. A structure about one-

way Ferry to the desired places. The Flatbush avenue connection has been practically completed and will carry the heavy summer traffic, opening about the middle of May.

The map, Fig. 1, shows the position of the tracks between Rockaway Beach and Far Rockaway which are about seven miles apart. The road between these places is being double tracked and electrified. The electric cars will be run between the regular steam cars and when the electrics reach Far Rockaway they will be switched off to the surface tracks of the local railroad. In connection with this part

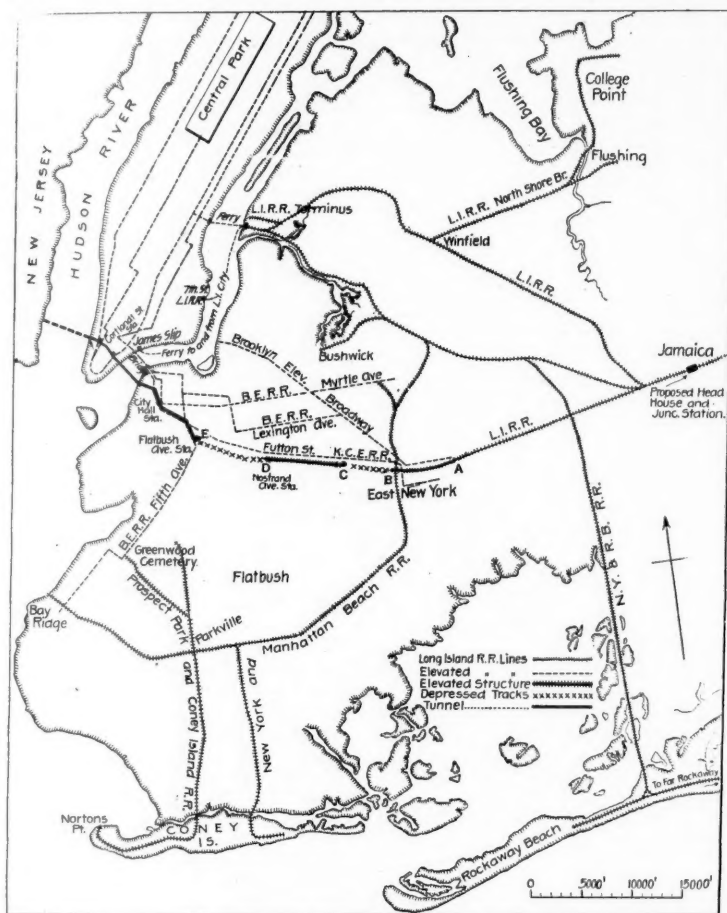


Fig. 1.—Lines of the Long Island Railroad, with Connections to Summer Resorts.

of the work, it should be added that it is proposed to build a loop at Rockaway Park for the elevated railroad trains which will run to that place. This loop will be built on an elevated structure and the present tracks will be extended from Seabright to the Park, and will be used by the electric and the regular steam trains.

Last year 73 miles of track on the Long Island were oiled. It is proposed to oil this same stretch of track this year, being the extreme eastern end of the island in the very sandy country, where the track is not now ballasted. With the exception of this 73 miles, all main lines have now been thoroughly ballasted with pea coal cinder, which is dustless and lasting. The track has been turned from one of the dustiest in the country to a practically dustless roadbed. Oil will be used only at those places where ballast has not been applied. The oil, however, has proved to be thoroughly satisfactory both in producing a dustless roadbed and in preserving the ties and shedding water, so that the oiled portions of the track were little affected by frost.

Among the new methods and new equipment to the rolling stock are the following: Three consolidation locomotives, 21 in. x 28 in., have been received, and their performance has been very satisfactory.

tive Works have built one shift engine with 51-in. drivers, cylinders 18 in. x 24 in.

A small independent power house has just been built at the Richmond Hill shops and the Ingersoll-Sergeant compressor is now supplying all the air pressure for the shops. The new compressor will have a capacity of 638 cu. ft. of free air compressed to 100 lbs. per sq. in. per minute.

The new cars which will be added to the service include eight parlor cars 65 ft. in length with 36-in. wheels (steel tired) made by Barney & Smith; 30 standard coaches made by the Wason Company with mahogany finish inside in place of oak. Mr. S. F. Prince, Jr., Supt. Motive Power and Equipment, states that the mahogany finish gives better satisfaction than the oak. Twenty combination cars are also being made and 30 elevated railroad cars will be added to the present equipment, making 88 new parlor cars and coaches. The Prospect Park & Coney Island cars, 51 in number, are also being remodelled, and among other additions Adams & Westlake curtain fixtures are being put in. Much of this work has been finished.

Seven parlor cars, six combination and 44 coaches have had a general overhauling and have been supplied with Pintsch gas fixtures.

Two gas transport cars have been built at the shops for carrying Pintsch gas from the main gas plant at Long Island City to cars in service on the Atlantic Avenue Division, making it unnecessary to run each car to Long Island City to refill the tanks. The gas is used at the Richmond Hill shops for burning off the old paint from cars before repainting.

Formerly gasoline was used for this work, and the cost was about \$14 for each car. By the Pintsch gas the cost for each car is about \$4.

#### Liquid Air as a New Source of Power—Another Engineering Fallacy.

In the March number of McClure's Magazine there is published an article entitled "Liquid Air—a new substance that promises to do the work of coal and ice and gunpowder, at next to no cost," which is so eminently calculated to mislead the general reader and even to become the basis of financial frauds, like that of the Keely motor, that it would seem a duty to draw attention to the fundamental errors in scientific principles and in statement of facts which this article contains.

This article may be fairly considered as made up of two prominent elements or parts, one of which is the statement of certain things as facts which, as I shall presently show, cannot possibly exist and are inconsistent with other facts stated in the same article and known from other sources to exist as so stated; while the other main element consists of rather vague statements concerning general principles which, though in a general sense true, yet as here used are calculated to cover up or begot the too



Fig. 2.—Elevation of Land Along Route of Proposed Atlantic Avenue Improvements in Brooklyn and the Proposed Tunnel to New York.

fifth of a mile long was completed nearly a year ago, by means of which last summer the Long Island Railroad ran its cars over the tracks of the elevated road, thereby connecting the Broadway Ferry and Jamaica, Far Rockaway and other suburban places. The plan and profile of this connection is shown in Fig. 3. It is very substantial, being strong enough to carry the heavy compound locomotives recently added to the rolling stock.

The connection at Flatbush avenue is shown in Fig. 4 and is built in very much the same substantial way as the Chestnut street structure near Cypress Hill Cemetery. By means of these two connections a large part of the traffic to the summer resorts will be carried directly from the bridge and the Broad-

They are now getting five 10-wheel 21 in. x 26 in. engines with wide or Wooten firebox and with 60½ in. driving wheels. These will be delivered from the Brooks Locomotive Works about the middle of May.

Eighteen engines, 17 in. cylinders, have been fitted with new boilers of "Wooten" type, and with 180 lbs. pressure, the locomotive, which burn small, hard coal, producing no smoke, can handle any passenger train on the road. One of the remodeled engines is shown in Fig. 5. From the top of stack to the rails is 14 ft. 3 in. To accommodate the wide fireboxes it was necessary to raise the boilers, which required adding an extension to the saddle, as shown in the side elevation. The distance from the track to the center of the boiler is 9 ft. The Baldwin Locomo-

obvious inconsistencies of the statements of facts, with the established principles of science.

As an example of the first element, we find on p. 400 as follows: "I have actually made about ten gallons of liquid air in my liquifier by the use of three gallons in my engine." This I shall presently show is simply impossible and inconsistent with data given elsewhere in this article and known to be substantially correct.

A sample of the other element is found on p. 399 in the following: "That is perpetual motion you object. 'No,' says Mr. Tripler sharply; 'no perpetual

\* By President Henry Morton, Ph. D., LL. D., Sc. D., President of the Stevens Institute of Technology. Reprinted from the Stevens Institute Indicator, April, 1899.





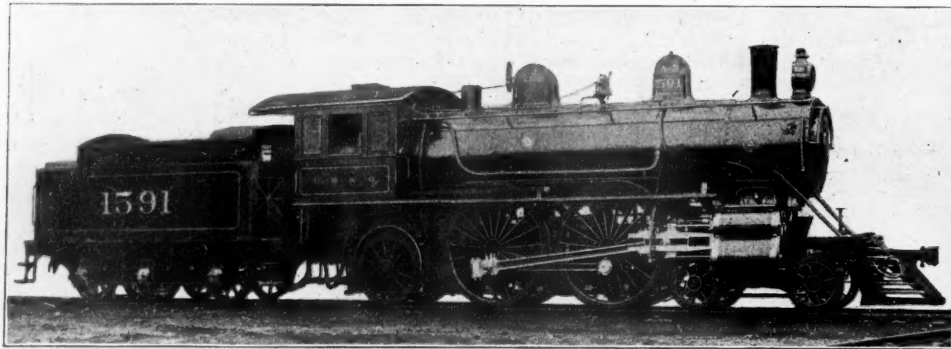
plant. Its entire output would be 50 gallons of liquid air a day, and this, as we have seen, could only develop in an ideally perfect engine  $\frac{3}{4}$  horse-power for an hour for each gallon, or  $3\frac{3}{4}$  horse-power for a day of ten hours. This does not look as if heat obtained from the atmosphere and operating an engine by aid

back of the rear driving axles to permit of a greater depth of firebox, the firebox being placed above the frames. The boiler is of the straight type, designed for a working steam pressure of 210 lbs., and has a total heating surface of 2,500 sq. ft., of which 2,320 sq. ft. is in the tubes. The tender is of the six-wheel

types now in use on the road with a view to determining the best type for different kinds of trains. These three types are: (1) the Columbia, shown in the second column of the table, (2) a mogul with 19 in. x 26 in. cylinders and piston valves and (3) two moguls with 19 in. x 24 in. cylinders and plain D valves.

Additional dimensions of the Atlantic type locomotives are as follows:

Gage	4 ft. 8 $\frac{1}{2}$ in.
Simple or compound	Compound
Kind of fuel to be used	Soft coal, low grade
Wheel base, total, of engine	27 ft. 1 in.
" " driving	7 ft. 6 in.
" " rigid	15 ft. 0 in.
Height, center of boiler above rails	9 ft. 0 in.
" of stack	14 ft. 9 $\frac{1}{2}$ in.
Drivers, material of centers	Cast steel
Truck wheels, diameter	36 in.
Journals, driving axle, size	8 $\frac{1}{2}$ x 12 in.
" truck	5 $\frac{1}{2}$ x 10 in.
" trailing	8 $\frac{1}{2}$ x 12 in.
Steam ports, length, circular	23 $\frac{1}{2}$ in.
" width	1 $\frac{1}{2}$ in.
Exhaust ports, length, circular	23 $\frac{1}{2}$ in.
" width	4 $\frac{1}{2}$ in.
Bridge, width	3 and 2 $\frac{1}{2}$ in.
Valves, kind of	Piston balance
greatest travel	5 $\frac{1}{2}$ in.
" outside lap, positive	h. p. $\frac{3}{4}$ , l. p. $\frac{1}{2}$ in.
" inside lap, negative	h. p. $\frac{3}{4}$ , l. p. $\frac{1}{2}$ in.
" lead in full gear	h. p. $\frac{3}{4}$ , l. p. $\frac{1}{2}$ in.
Boiler, material in barrel	Steel
" thickness of material in barrel	1 $\frac{1}{2}$ in.
" diameter of barrel	62 in.
Seams, horizontal, butt jointed double covering strips	double riveted
Thickness of tube sheets	1 $\frac{1}{2}$ in.
" crown sheet	1 $\frac{1}{2}$ in.
Crown sheet stayed with	Radial stays
Dome, diameter	34 in.
Firebox, length	10 ft. 1 $\frac{1}{2}$ in.
" width	3 ft. 4 $\frac{1}{2}$ in.
" depth front	74 $\frac{1}{2}$ in.
" back	70 $\frac{1}{2}$ in.



Atlantic Type Fast Passenger Locomotive for the Chicago, Burlington & Quincy.

Built by the BALDWIN LOCOMOTIVE WORKS, Philadelphia, Pa.

of liquid air, was likely to become a dangerous rival to the coal mine.

On p. 402 of the McClure article it is stated that Mr. Tripler makes his liquid air at a cost of 20 cents a gallon.

We have shown above that the maximum power obtainable from this liquid air, by heating it to ordinary atmospheric temperature, is  $\frac{3}{4}$  of a horse-power-hour. This at 20 cents would be vastly more expensive than power derived from an ordinary steam engine, whose cost ranges from less than 1 cent per horse-power-hour under the best conditions to 3 or 4 cents, where a profit is included, or the conditions are less favorable.

#### The New Passenger Engines of the Burlington.

The Chicago, Burlington & Quincy has recently received from the Baldwin Locomotive Works two remarkable locomotives of the Atlantic type for heavy fast passenger service, which are considerably the largest engines of this type so far built. Further, if we exclude some ten-wheel locomotives built last year for the Great Northern, which might properly be classed as freight engines, the new Burlington locomotives become, according to our records, the heaviest ones built up to this time for passenger service; in any case the statement holds true for engines designed for high speed work. The Great Northern ten-wheelers referred to have total weights of 166,000 lbs., 2,677 sq. ft. of heating surface, and 63 in. driving wheels. In this connection, it should also be mentioned that the Chicago & Northwestern has just received some eight-wheel fast passenger locomotives, which have boilers practically the same size as those of the new Burlington engines, but at this time data are not available as to the exact proportions.

The new Burlington engines were built from designs made by the builders in accordance with the general specifications of Mr. F. A. Delano, Superintendent of Motive Power of the road. They will both be used between Chicago and Galesburg, a distance of 206 miles, making a round trip each day. One has now been assigned to hauling the vestibule train, weighing 371 tons, scheduled to leave Chicago at 1.30 P. M. and arrive at Galesburg at 6.30 P. M. On this run there are eight station stops and two crossing stops; the schedule speed is about 41 miles per hour. The eastbound run is made on about the same schedule, but the train weighs only 333 $\frac{1}{2}$  tons. The light weights of the two trains in detail are as follows:

Westbound.	Eastbound.
1 baggage car..... 65,400 lbs.	1 baggage car..... 46,800 lbs.
1 baggage car..... 66,600 "	1 baggage car..... 45,000 "
1 composite car..... 104,000 "	1 mail car..... 77,900 "
1 sleeper..... 105,000 "	1 smoking car..... 69,700 "
1 sleeper..... 104,000 "	1 chair car..... 63,900 "
1 dining car..... 94,000 "	1 chair car..... 63,900 "
1 chair car..... 68,000 "	1 sleeper..... 105,500 "
1 chair car..... 68,000 "	1 sleeper..... 96,800 "
1 coach..... 67,700 "	1 dining car..... 93,700 "
Total..... 742,700 "	Total..... 663,200 "

It has not yet been definitely decided whether the other new engine will be regularly assigned to heavy passenger service or to the fast mail trains. The westbound mail train usually consists of four cars weighing, empty, about 43 tons each, and the loading varies from 16 to 30 tons per car. While the speed of this train is high, especially when delayed at Chicago, the ordinary mail train would not be an economical load for this engine and it is possible that the new locomotive will therefore haul the mail train only when there are six or seven cars to be taken. Heretofore in such cases the extra mail has been held over for a later train.

The accompanying engravings show the appearance and general features of these engines. The Vaucelin system of compounding is used, the guides are made very rigid and the piston valves are 11 in. in diameter; the driving wheels are 84 $\frac{1}{2}$  in. in diameter. The frames are 5 in. wide and depressed 11 in.

type, weighs about 100,000 lbs. when loaded and has a capacity for 5,000 gallons of water and 8 $\frac{1}{2}$  tons of coal. The underframe is of steel and the journal boxes work in pedestals fastened to the tender frame.

In the accompanying table the principle dimensions of these locomotives are given, together with

Table of Heavy Passenger Locomotives.

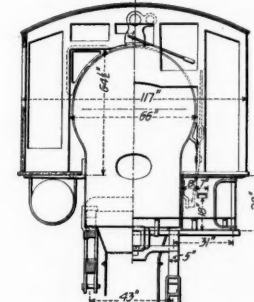
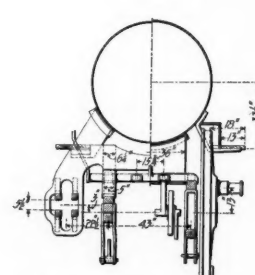
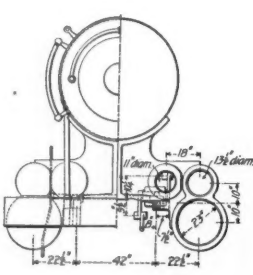
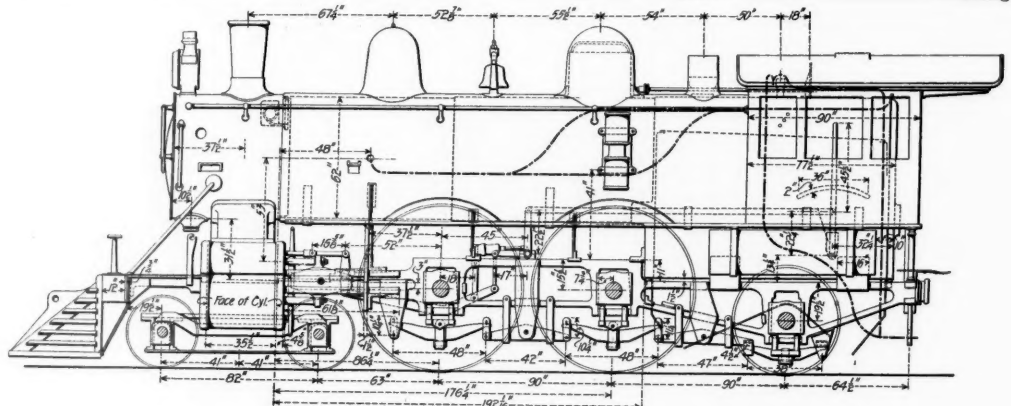
Published in Railroad Gazette	This issue.	Dec. 6, 1895	July 21, 1896	June 12, 1896	April 28, 1895	Dec. 27, 1895.
Name of road	C. B. & Q.	C. B. & Q.	{ C. M. & St. P. Atlantic	Atlantic City	N. Y. C. & H. R.	P. R. R.
Type	Atlantic	Columbia	Atlantic	Atlantic	Atlantic	Atlantic
Number or class	1591	1590*	838	1127	999	8-wheel
Cylinders	19 x 26	19 x 26	13 and 22 x 26	13 and 22 x 26	19 x 24	18 $\frac{1}{2}$ x 26
Driving wheels	84 $\frac{1}{2}$ in.	84 $\frac{1}{2}$ in.	78	84 $\frac{1}{2}$ in.	86	80
Weight on driving wheels	85,850 lbs.	86,200	71,600	78,600	84,000	91,600
" front	40,200	20,000	40,000	37,000	40,000	43,200
" trailing	33,000	31,800	29,100	27,300	27,000	27,000
" total	159,050	138,000	140,700	142,900	124,000	134,800
Boiler pressure	210 lbs. per sq. in.	200	200	200	190	185
Heating surface, firebox	180 sq. ft.	151	171	136	233	171
" combustion chamber	37	37	54	54	185	171
" tubes	2,320	1,393	2,073	1,645	1,697	1,747
" total	2,500	1,581	2,244	1,835	1,930	1,918
Graze area	35	30	30	72	30 7	33

\* Originally No. 590.

similar dimensions of several noted high-speed engines arranged so as to afford a ready comparison.

So much has been published about the performance of all but the first of these locomotives that it is probably unnecessary now to say more than that they represent the highest development of the fast passenger engine on the roads named. The list might be considerably extended, but probably enough are given to show the tendency toward high steam pressures and big boilers. It will be noted that the

Firebox, material.....Steel  
thickness of sheets.....Sides  $\frac{3}{8}$  in.  
brick arch.....Yes  
water space, width.....Front, 4 in.; sides, 4 in.; back, 4 in.  
Grate, kind of.....Rocking grate and drop  
Tubes, number.....248  
material.....Iron  
outside diameter.....2 $\frac{1}{2}$  in.  
length over sheets.....16 ft. 0 in.  
Smokebox, diameter.....63 in.  
length.....57 in.  
Exhaust nozzle, double.....Netting  
permanent.....Netting  
Netting, wire or plate.....Netting



Atlantic Type Locomotive for the Chicago, Burlington & Quincy.

large boilers are the characteristic feature of the Burlington Atlantic type locomotives, as shown by the heating surface. This is the important factor in heavy, fast service.

The Burlington will compare the performance of the new engines with that of the three principal

Stack, straight or taper.....Straight  
diameter.....16 in.

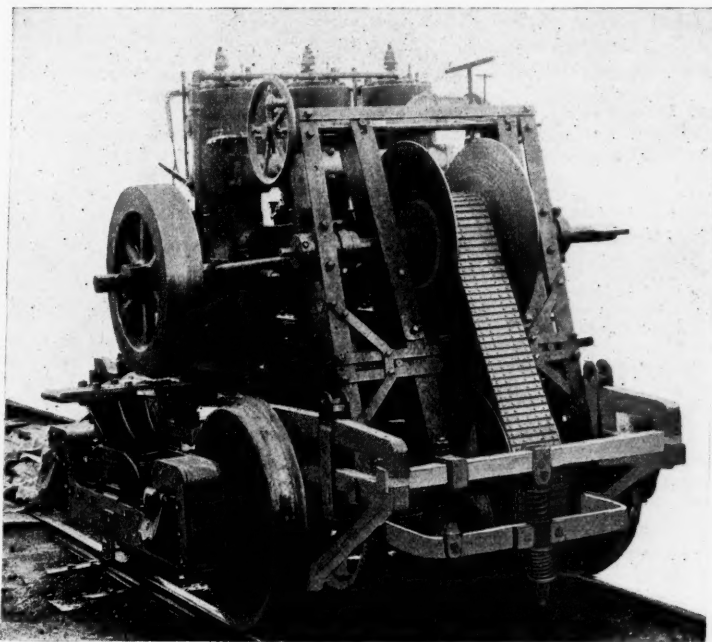
Tender.  
Type.....Six-wheel  
Tank capacity for water.....5,000 gal.  
Coal capacity.....8 $\frac{1}{2}$  tons  
Kind of material in tank.....Steel  
Thickness of tank sheets..... $\frac{3}{8}$  and  $\frac{1}{2}$  in.



Type of underframe.....Steel  
 Type of truck.....Wheels working in pedestals  
 Springs.....Half elliptic  
 Diameter of truck wheels.....42½ in.  
 " and length of axle journals.....6¼ x 10 in.  
 Type of back drawhead.....Janney coupler

#### A Gasoline Motor Car.

During the past year a good deal of attention has been given to self-contained motor cars for suburban service where the main tracks of steam railroads have been paralleled by electric trolley roads and also for working branch lines. In most cases, so far, steam motor cars have been used for such places, and from time to time the cars built for the New



Driving Machinery of the Jewett Gasoline Motor Car.

England, the Erie, the Cincinnati, Hamilton & Dayton, Erie & Wyoming Valley and the Pittsburgh, Cincinnati, Chicago & St. Louis have been described. Another road contemplates a trial of compressed air motor car. In this issue is shown a car, for a similar purpose, driven by a gasoline engine. This car was built by the Jewett Car Co., Jewett, O., for the Vimotum Hydrocarbon Car Co., of Chicago, and trials have recently been made on the Pennsylvania lines and the Cleveland, Cincinnati, Chicago & St. Louis in the vicinity of Indianapolis.

The engravings show the appearance of this car and the arrangement of the machinery. The car body is 41 ft. 6 in. long over all and 8 ft. 6 in. wide, with four-wheel trucks at either end, which have a wheel base of 4 ft. 6 in.; the wheels are 33 in. in diameter. The machinery is mounted on the front truck in such a way as to be entirely independent of the car body. The underframe rests on a metal transom, which transmits its load to plate truck frames supported by outside journal boxes and bearings. The load due to the gasoline engine and other machinery does not come on the transom, but is transmitted through a system of springs and equalizers to three points on a forged frame, the frame in turn being carried by the axles on inside bearings. The total weight of the car is about 42,000 lbs.

A 45 h.p., two-cycle gasoline engine of the vertical, three-cylinder type is used. It was made by the Wolverine Motor Works, Grand Rapids, Mich., and is so arranged that it can readily be reversed; the speed of the engine is regulated by a governor. As shown the engine shaft has on one end a fly wheel and on the other a pulley connected by a belt to an intermediate shaft which in turn drives, through a variable speed mechanism, a second intermediate shaft carrying a pinion; the pinion meshes with a gear on the forward car axle. The two intermediate shafts are mounted on an upright frame which at the upper end is held in position by braces from the engine shaft, so connected at the ends that the distance between the centers of the engine and first intermediate system is constant; at the lower end the frame is suspended by a system of links and springs from the frame which supports the engine. The distance between the car axle and the second intermediate shaft is kept constant by a yoke which engages the axle, thus keeping the gears in mesh. It will be seen that while the several parts are mounted on springs permitting vertical movements, the relations of the parts one to another do not vary.

The essential feature of the driving mechanism is the variable speed device interposed between the engine shaft and the car axle, which has been used in machine shops for several years, and is made by the Reeves Pulley Co., of Columbus, Ind. As applied to this car it enables the gasoline engines to be started without load, and also provides a means for varying the ratio of the pulleys to suit the work. It will be seen that each of these pulleys consists of a

pair of truncated cones with their smaller bases facing one another, thus forming a V-shape groove in which a belt runs. These pulleys are fitted to the shafts with feathers so that the cones can be moved toward each other or apart along the shaft. This adjustment is made by levers, so pivoted near their centers, that as the cones on one shaft approach each other, those on the opposite shaft are moved apart sufficiently to maintain the same belt tension; ball thrust bearings are provided between the cone hubs and the levers. Any stretch of the belt is taken up by an adjustment that shifts the points at which the levers are fulcrumed. As shown, the levers are operated from a shaft near the top of the upright frame, having a right and left hand screw thread, which is worked by a hand wheel.

The belt is continuous and of peculiar construction. On either side of a cemented raw hide belt, at regular intervals, rectangular layers of sole leather are built up with top and bottom plates and the whole riveted together. In this way the belt is flexible longitudinally, but rigid in cross-section. As the belt has a bearing only along its edges the ratio of the pulleys is varied by changes in the relative positions of the cones on the intermediate shafts. Also, when the upper cones are wide apart, and there is no longer a bearing at the sides, the belt is carried on a small idler between the cones, so that the engines can be run when the car is standing.

In starting the car, the engines are first brought up to speed; then the upper cones are moved together, starting the car when the speed of the belt is lowest. In stopping, the upper cones are separated and the brakes applied, it being immaterial so far as that operation is concerned whether or not the engines are stopped.

The car is fitted with Christenson air brakes, and beneath the car is a water tank and circulating pipes for the water used to cool the engine cylinders. The machinery was designed for speeds of about 25 miles an hour, but on a recent trial under favorable conditions several miles were made at 41 miles per hour.

#### A New Belt Dressing.

Prof. R. C. Carpenter, of Cornell University, has just completed a series of tests on a new belt dressing made by the Cling-Surface Manufacturing Co. of Buffalo. The tests were made to determine the effect of running with and without the preparation under various conditions of loading. The machine on which the belt was tested, was made to indicate the tension on the belt, the arc of contact on either pulley, the slip, and the power supplied. In all over 50 tests were made.

The belts before testing were in every case cleaned

Cling-Surface was found when there was the least possible tension on the belt and when the belt was running so slack that the sides very nearly touched. As the tension of the belt was increased, the transmitting capacity diminished until a tension of about 20 lbs. per inch of width of belt was reached, after which the transmitting capacity commenced to increase and from that point continued to increase with increase of tension.

In the test of the same belt not treated with Cling-Surface, the results were quite different, inasmuch as the capacity with very light tensions was practi-

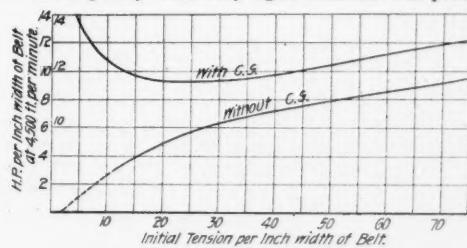


Fig. 1.—Horse Power Transmitted.

cally nothing and the capacity increased as the tension increased; at no point, however, did the untreated belt have even approximately the same capacity as the treated belt with the same tension; and moreover, the treated belt transmitted much more power with a very light tension than the untreated belt with a heavy tension. The test with the belts treated and untreated running on wooden pulleys showed essentially the same characteristics. The general effect of the Cling-Surface appears to enable the belt to transmit a power equal to its entire capacity without producing heavy stresses on the driving boxes of the pulleys, or in other words, it enables the full capacity of the belt to be obtained for transmitting power when the belt is so loose that the sides nearly touch.

Some results of the tests when the belts were running on iron pulleys is shown in the accompanying diagrams. In Fig. 1, the horizontal distances show the tension on the belt in pounds per inch of width, and the vertical distances show the horse power transmitted per inch of width of belt for a speed of 4,500 ft. per minute. The lower line represents the results obtained with the untreated belt; the upper line, the results obtained with the treated belt. It

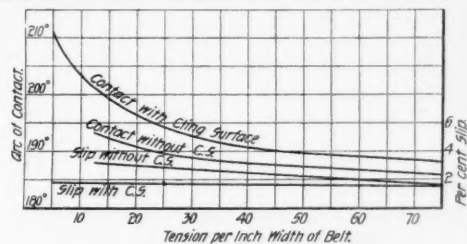
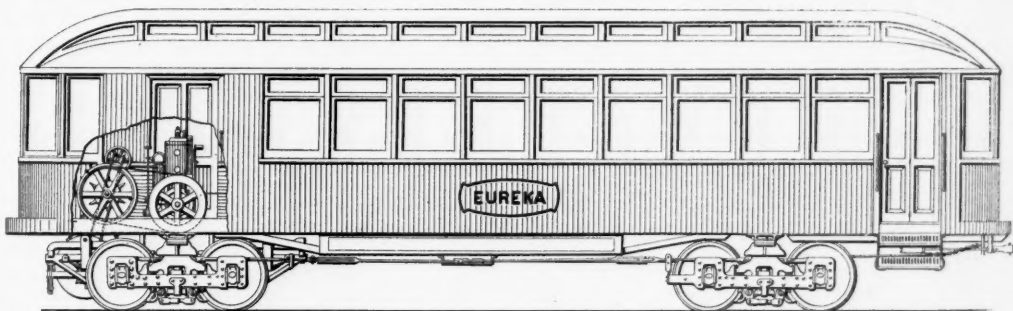


Fig. 2.—Arc of Contact and Slip.

will be noted that the lower line continually rises, showing an increase in capacity with an increase in tension; the upper line descends at first, showing a decrease in capacity with increase in tension, and later rises. In no place does the transmitting capacity of the treated belt fall below that of the untreated belt. In comparing the respective results it will be noted that the treated belt has a carrying capacity of 13.8 h.p. when the tension per inch of width is 5 lbs., while for the same conditions the untreated belt has no carrying capacity; furthermore, it is noted that the carrying capacity of the treated belt,



Gasoline Motor Car, Built by the Jewett Car Co., Jewett, O.

and in good condition, and were tested under average running conditions. The Cling-Surface was applied in small quantities on several successive days. The substance was almost wholly absorbed at the time of starting the tests and none was applied after the tests began. The following is from Prof. Carpenter's report:

The general results of the tests show an increased transmitting power of the treated belts as compared with the same belt in an untreated condition. They also show an increased arc of contact, and very much less slip. The treated belts show a high transmitting power when the belt is run extremely loose or with very little tension on the pulleys. The greatest transmission capacity for the belt treated with

even at this low tension, is nearly 40 per cent. higher than that of the untreated belt even when the tension has been increased to 80 lbs. per inch of width belt.

In Fig. 2 is shown the arc of contact and the maximum percentage of slip for belts run both in the treated and untreated condition with different initial tensions and on iron pulleys. From this, it is seen that the slip of a treated belt is much less, and the arc of contact greater for a given total tension than with the untreated belt.

The falling off in carrying capacity with increase of belt tension for the treated belt is doubtless due to the rapid change in the arc of contact, which diminishes with increase of tension. This causes a diminu-



tion in the transmitting power which is greater than that produced by the increase of pressure due to the increased tension on the belt. With the untreated belt such change is very slight, and consequently a falling off in carrying capacity for light tension takes place.

The general effect of the Cling-Surface is to soften the belt and to put it apparently in the best condition for transmitting power and retaining its good qualities. The surface produced by the Cling-Surface remains apparently unchanged after several weeks of use, and the inference to be drawn is that the material has an effect which continues permanent for some time, at least.

#### Improvements in Pneumatic Hammers.

The Standard Pneumatic Tool Co., Chicago, has for some time past been working to so modify its present pneumatic hammer that a large hammer may be used for light, as well as for heavy work. Quite often, even on rough work, it is necessary to strike some light blows, and it is inconvenient to change tools or use a hand hammer.

This improved tool, which is now being put on the market, will be known as the "New Little Giant," and furnished in four sizes. Size No. 1 is for driving rivets and for extra heavy chipping, No. 2 for heavy chipping, No. 3 for calking and beading flues, and No. 4 for beading flues and for light chipping. The No. 2 hammer weighs 8 lbs. and the No. 3, 7 lbs.

One of the new features is the means for regulating the throttle. The throttle, as heretofore, is opened by pressing down the small lever at the back of the hammer, which moves a piston in a horizontal bushing until the ports leading to the valve chamber are uncovered. However, instead of attempting to regulate the air by a partial movement of this lever so as to strike a light blow, this is accomplished in the latest hammer by an adjustment of the bushing in which the throttle works. This bushing is attached to a screw terminating in the head marked "regulator" in the engraving, such that one full turn



The "New Little Giant" Hammer.

of the screw causes the bushing to move to such a point that the ports are not uncovered. In the other extreme position the ports are fully uncovered when the handle is pressed down, while intermediate positions of the regulator result in various port openings and various degrees of throttling. The intermediate positions of the bushing are indicated by lines drawn on the regulating screw with reference to a fixed line on the body of the hammer. The regulating screw is prevented from turning, after being set, by a small pin under pressure from a spring which engages a series of holes at the rear of the screw head; the pin is readily released by pushing back a knob at the side and just behind the regulator.

The ports in the barrel of the new hammer have been arranged so that, on the return, the piston is stopped by the compression of the air remaining in the cylinder after the exhaust port is closed, and not by the admission of air before the return stroke is completed. The makers claim that the efficiency of the tool is materially increased in this way. Considerable pains have also been taken to provide a positive lock between the barrel and the handle. The sleeve is threaded in the usual way, and at the base of this thread a worn thread is cut on the periphery of the sleeve; a short screw, passing through the body of the hammer, engages the worn thread and locks the barrel, while this screw is in turn locked by a second screw of a different pitch.

#### The Service Results of the M. C. B. Coupler.

We lately asked the General Manager of an important railroad the following questions as to his observations and experience with the Master Car Builders' Coupler:

(1) There has been a reduction in casualties to employees; what part of this is attributable to the automatic coupler?

(2) What has been the effect on cost of repairs and maintenance of freight cars?

(3) Can heavier trains be handled with the vertical plane coupler?

(4) Is there any saving of time in switching? Do not men still have to go between cars in motion?

To these the General Manager answers as below:

(1) While the falling off in business since 1893 has possibly reduced the number of accidents, there can be no question but that the application of M. C. B. couplers has been the chief cause for the improvement in record of accidents to employees. The result would have been more marked were it not for

the additional risk caused by having to couple M. C. B. with link and pin couplers.

(2) We have no data from which an answer could be given to your second question, nor do I know of a road which could give you reliable information on this subject. My idea is that there is a considerable saving both as to cost of damages in collisions and of ordinary repairs. The M. C. B. couplers eliminate the greater portion of the slack between cars, and reduce, very materially, the possibility of cars telescoping.

(3) Engines will not haul the same tonnage where cars are equipped with M. C. B. couplers as they will if cars are equipped with link and pin couplers.

(4) Under the present condition of affairs men must still go between cars equipped with M. C. B. couplers to raise lock pins, open knuckles, drive lock pins down, etc. Three men hurt lately on this account.

After dictating the foregoing, I propounded the following questions to eight of our most experienced yard masters. Under each question, I give you an outline of their answers:

1. What, in your opinion, is the relative safety of M. C. B. couplers, compared with the link and pin, as far as injury to yard men is concerned?

A....M. C. B. couplers are much safer.

B....M. C. B. couplers are more dangerous. A great many chains are disconnected from locks. Must go between such cars and hold lock up with your fingers. Many chains are too long. Locks get out of order. Rod that raises lock should run across the car, so that if one lock rod will not raise, it will not be necessary to climb over the train in order to get at the other lock rod.

C....Link and pin is the safest. Thirty years' experience as yard master. Have had two men with their fingers mashed with M. C. B. couplers; none with link and pin. Many chains are either broken or too long. Must go between cars to raise lock pin with hand.

D....Prefer link and pin.

E....My observation is that more men are injured with M. C. B. than with link and pin couplers.

F....Link and pin the safest. Many lock pin chains either disconnected, broken or too long. Must go between cars to open knuckle. If chains and locks are all right, with many couplers, must (when cars are being backed off) run along and hold lock lever until forward part of train slows up.

G....Less risk with M. C. B. couplers.

H....Link and pin much the best. When you pull pin you know the train is cut; when you pull lock lever of M. C. B. coupler you cannot say whether lock pin has been raised or not. Often, you must run along side of car until forward part of train slows up.

2. Does application of M. C. B. couplers reduce the damage to cars in case of collision?

A....Yes; one reason being that cars do not telescope as easily with M. C. B. as with link and pin couplers.

B....Yes. We get rid of slack and cars are prevented from telescoping.

C....Does not answer.

D....Does not answer.

E....Cannot say that it will reduce damage.

F....Yes.

G....Yes.

H....Does not answer.

3. Does the application of M. C. B. couplers to freight cars reduce the cost of ordinary repairs?

A....Yes. Draft rigging is not punished near so much.

B....Cannot say. Should think it would.

C....Does not answer.

D....Does not answer.

E....Yes.

F....Yes.

G....Yes.

H....Yes.

4. Can heavier trains be hauled with vertical plane couplers than with link and pin?

A....No. Most all hard pulls are on curves and couplers have but little side motion. Cannot bunch slack in order to get started.

B....No. With M. C. B. couplers rating of engines have to be cut down on mountain.

C....Engines will not pull as much.

D....Does not answer.

E....Engines pull more cars when they are coupled with link and pin.

F....Heavier trains can be pulled with link and pin couplers.

G....Heavier trains can be pulled with link and pin couplers.

H....Does not answer.

5. Is there any saving in time in switching?

A....No. There are about eight makes of couplers that are all right and give good service. Many of the couplers are very inferior. Will not couple nor uncouple unless two or three attempts are made, and frequently must couple with link and pin. Often have to slack ahead to see that cars are coupled.

B....No time saved in switching. Can do better and quicker work with link and pin. M. C. B. couplers become worn. They fail to couple and must slack ahead to see what is wrong. Many times lock chain is either broken, disconnected or too long, requiring second attempt to uncouple.

C....Can do more switching with link and pin.

D....Can do more switching with link and pin. Have had to knock knuckle pin out in order to get cars apart. Frequently have to couple M. C. B. couplers with link and pin.

E....There is no time saved in switching cars with the M. C. B. couplers. An attempt is made to cut the cars; lock chain is broken or disconnected, lever bent, or lock sticks in coupler, requiring second attempt to uncouple, and often must go in and hold lock pin up or climb across the train and work lever on other car.

F....The only advantage in time gained by having M. C. B. couplers, is in the fact that the probabilities are the cars will couple themselves when they come together, but this fact is more than overbalanced in the act of uncoupling. With one you pull the pin and get out; with the other you are very apt to have to run along with the cars until engineman applies brakes. On the whole, think advantage is with link and pin.

G....Considerable time is saved in switching with M. C. B. couplers, provided lock pin chains are all right.

H....No time saved. When you pull pin you know cars are cut; when you raise lock lever of M. C. B. coupler you do not know whether cars are going to part or not. Should they fail you must go in between cars and get hold of lock pin, and frequently must run along between the cars until engineman applies brakes.

6. Is there any comparison between risk brakemen and yardmen run in going between cars to open knuckles, as compared with the risk they run going between cars to change links or set pins?

A....No.

B....There is no comparison. After couplers become worn or some of the parts get out of order, you have to slack ahead and examine coupler to see why they do not couple. Frequently lock pins are broken or disconnected. When you cut off a car you pull pin and step out of the way. At times we find pin bent and have to stop and knock it out, but this is not often the case. Frequently find M. C. B. couplers out of order in some way and must either go in and hold knuckle lock up or hold lever up for four or five car lengths.

C....With link and pin coupler you set pin with your feet outside of rail, but with an M. C. B. coupler you must be in between the rails, hold lever with one hand and open knuckle with the other. If engine is coupled to cars, you have to step out and motion engineman down until this is done. Very often the chains are broken and you have to raise lock pin with your hand and open knuckle and make coupling.

D....It is not necessary now to change links and pins, as drawbars are about the same height. Very little risk to set pin, but to open knuckle you must run along between rails, hold lever with one hand and open knuckle with the other.

E....The comparison of going between cars to open M. C. B. knuckles, with the risk run to change links or set pins, is this: If the pin lifting lever works all right, the risk is about the same as adjusting the link. If the lever does not work O. K., then the risk is greater with M. C. B. couplers, on account of having to raise lock pin with the hand, and often it has to be held up until cars strike.

F....I consider the act of changing link from one drawbar to another equally as dangerous as opening a knuckle, but in studying this particular question it must be remembered that it is not always necessary to change the link, it is always necessary to open the knuckle. It is not as dangerous to set pin as it is to open knuckles. Pin can be set without going between cars.

G....If everything works all right, knuckles are opened and men steps out from between the cars and they come together; but with link and pin he must stay between the cars until they do come together.

H....More risk opening knuckles.

7. Wherein is M. C. B. coupler a failure, from yardman's standpoint?

A....M. C. B. couplers are not failures from a yardman's standpoint. Imperfect or badly maintained couplers are doing M. C. B. couplers much damage and this makes our work more dangerous. After all cars are equipped and the coupler apparatus kept up as it should be, there will be no need of yardmen going between cars when they are moving. There are too many kinds of couplers and too many inferior ones. Car owners should get together and adopt six or eight of the best; then railroads could keep supplies, keep couplers in order and much trouble would be avoided. At present, cut off rods, chains and lock pins are not kept in order.

B....Couplers are not kept in order. Many chains and rods are either broken, disconnected, too long or bent. Lock pins are broken. Failure of M. C. B. couplers to couple on curves. If we hit them too hard, claim agent has to settle damage, where cars are loaded with merchandise. Rods should run across ends of cars. Knuckles are worn. Where there is no play between draft timbers, cars are often derailed on curves.

C....Does not answer.

D....Does not answer.

E....M. C. B. couplers are failures from a yardman's standpoint, from this: They are nearly always out of order and cause delays in coupling and uncoupling cars. Often have to make several trials in order to get them coupled or uncoupled.

F....Does not answer.

G....M. C. B. couplers are not failures from a yardman's standpoint.

H....Does not answer.

These men have had considerable experience in yard work, seven of them having been in the service twenty-five years or more, and the eighth one something like fifteen years. While they do not agree on all points, some valuable deductions may be made from their answers.

I am decidedly of the opinion that the risk will be very materially lessened and yard work greatly facilitated when the link and pin couplers are discarded and when more attention is given to lock chains and rods.

On April 5th, 247 cars were examined, 19 of which had lock chains either broken or disconnected.

On April 6th, 253 cars were examined, 31 of which had lock chains or levers out of order.

On April 11th, 216 cars were examined, 43 of which had lock chains or levers out of order.



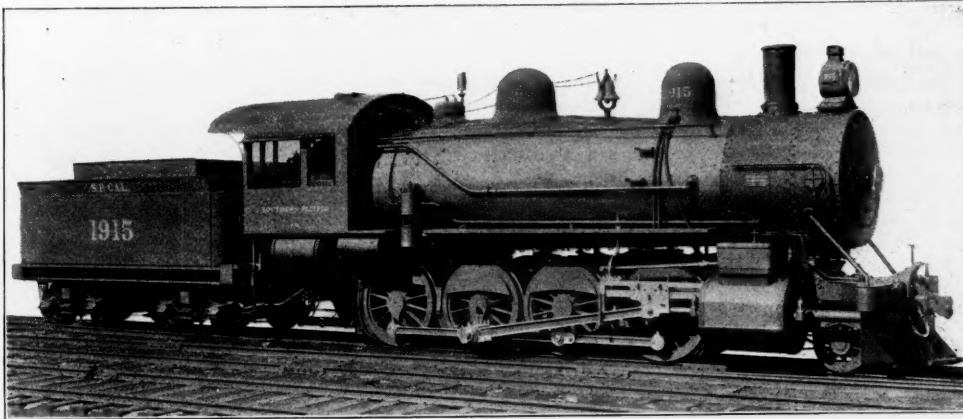
There is annoyance and danger from the following causes: Failure to keep lock levers and chains in proper order; use of couplers so constructed that in backing off cars men must run along at the side and hold lock lever up until front port of train slows up, or must latch the lock lever in the position for holding lock up and thus leave the lock so it will not engage the knuckle when the knuckle is again closed; that in some couplers the lock lever must be raised and immediately dropped in order to release the knuckle, while in others if the lock is raised too far it will not release knuckle, and in others still, on account of slot in lock, the lever must be raised just so far; that many locks refuse to drop when cars come together, even if they are in position; that many locks are so constructed that tail of knuckle will not force them up, unless the cars are brought together with very great force; that lock rods do not extend across cars, and that badly worn knuckles and locks are permitted to run.

A coupler so constructed that it will only be necessary to raise the lock rod and let it drop in place again, leaving the knuckle free to open; and after knuckle is open, the lock to be in position to engage the knuckle when it is again closed, will avoid many of the complaints lodged against the M. C. B. coupler.

#### Compound Consolidation Locomotives for the Southern Pacific.

The engraving shows one of a lot of six heavy compound consolidation locomotives, built by the Schenectady Works for service on the heavy grades of the Southern Pacific Company's lines in California. These locomotives are of the two-cylinder compound type, built according to the Schenectady Locomotive Works system of compounding. The cylinders are high pressure 23 ins. diameter by 34 ins. stroke; low pressure, 35 ins. diameter by 34 ins. stroke, and the weight on drivers is 86½ tons. The locomotives have given excellent results both in fuel economy and power developed. The descriptive specification follows:

General.	
Gage.....	4 ft. 8½ ins.
Fuel.....	Bituminous coal
Weight in working order.....	193,000 lbs.
on drivers.....	173,000 lbs.
Wheel base driving.....	15 ft. 8 ins.
" " rigid.....	15 ft. 8 ins.
" " total.....	24 ft. 4 ins.
Cylinders.	
Diam. of cylinders.....	23 and 35 ins.
Stroke of piston.....	34 ins.
Horizontal thickness of piston.....	5½ and 4½ ins.



Schenectady Compound Consolidation Locomotive for the Southern Pacific.

Diam. of piston rod.....	3½ ins.
Kind " " packing.....	Cast iron
rod packing.....	Jerome
Size of steam ports	
H. P. 20 ins. x 1½ ins.; L. P. 23 ins. x 2½ ins.	
" exhaust ports.....	
H. P. 20 ins. x 3 ins.; L. P. 23 ins. x 3 ins.	
" bridges.....	1½ ins.
Valves.	
Kind of slide valves.....	Allen-American
Greatest travel of slide valves.....	6 ins.
Outside lap " " ".....	H. P. 1½ ins.; L. P. 1 in.
Inside " " ".....	¾ in.
Lead of valves in full gear.....	¾ in.
Kind of valve steam packing.....	Jerome
Wheels, etc.	
Diam. of driving wheels outside of tire.....	57 ins.
Mat'l " " centers.....	Cast steel
Tire held by.....	Shrinkage
Driving box material.....	Cast steel
Diam. and length of driving journals.....	9 ins. dia. x 12 ins.
Diam. and length of main crank pin journals.....	6½ ins. dia. x 6 ins.
Diam. and length of side rod crank pin journals.....	F. & B. 5 x 3½ ins. Inter. 5½ ins. dia. x 4½ ins.
Engine truck, kind.....	2 Whl. Swing Bolster
journals.....	6 ins. dia. x 10 ins.
Diameter of engine truck wheels.....	30 ins.
Kind of engine truck wheels.....	Krupp No. 3 steel tired C. I. spoke center with retaining rings.
Boiler.	
Style.....	Extended wagon top
Outside diam. of first ring.....	72 ins.
Working pressure.....	220 lbs.
Mat'l of barrel and outside of fire box.....	Carbon steel
Thickness of plates in barrel and outside of fire box.....	1½, ¾, 1, ¾ in.
Horizontal seams, butt joint sextuple riveted with welt strips inside and outside.....	
Circumferential seams.....	Double riveted
Fire box, length.....	126 ins.
" " width.....	40½ ins.
" " depth.....	F. 77 B. 73½ ins.

Fire box, material.....	Carbon steel
plates, thickness, Sides, ¾ in.; back, 1 in.;	
" " " crown, ¾ in.; tube sheet, 1 in.	
" " " water space.....	
front, 4½ ins.; sides, 3½ ins. to 4 ins.; back, 3½ ins.	
to 4½ ins.	
" " " crown staying.....	Radial, 1½ ins. dia.
Tubes, material.....	Charcoal iron, No. 12
number of.....	332
" diam.....	2½ ins.
" length over tube sheets.....	14 ft. 6 in.
Fire brick, supported on.....	Studs
Heating surface, tubes.....	2817.30 sq. ft.
" " " fire box.....	210.50 sq. ft.
" " " total.....	3027.80 sq. ft.
Grate.....	35.3 sq. ft.
" style.....	Rocking, R. R. Co.'s style
Ash pan.....	
Hopper, worked by air dampers front and back.....	
Exhaust pipes.....	Single
nozzles.....	5½ ins., 5½ ins. and 5½ ins. dia.
Smoke stack, inside diameter.....	18 ins. at top, 16 ins. near bottom
" " " top above rail.....	14 ft. 11½ ins.
Boiler supplied by.....	Two injectors, N. & Co. Monitor latest improved
No. 10, Pos. R. & L.	
Tender.	

Weight, empty.....	33,200 lbs.
Wheels, number of.....	8
diam.....	33 ins.
Journals, diam. and length.....	4½ ins. dia. x 8 ins.
Wheel base.....	15 ft. ¼ in.
Tender frame.....	10 in. steel channels
" trucks.....	
2-4 whl. channel iron cen. bearing F. & B. side bearings	
on back truck.....	
Water capacity.....	4,000 U. S. gallons
Coal.....	9 tons
Total wheel base of engine and tender.....	51 ft. ¾ in.
Engine equipped with:	
3-3 in. consolidated encased safety valves.	
Westinghouse & American combined brakes on drivers,	
tender and for train.	
Leach sand feeding apparatus.	
Cab of steel and iron.	
Sweeney brake arrangement on L. H. St. Chest.	
Le Chatelier water brake on low pressure cylinders.	

#### A Pole Railroad to the Klondyke.

Mr. Edward Gibson Tilton, President of the Miles Canyon & White Horse Tramway Co., writes to us regarding his road, which is probably the most northerly on this continent, it being in latitude 62°. This company, which was incorporated under the Dominion laws, June 13, 1898, was formed for the purpose of providing safe and speedy transit of goods around the obstructions to navigation at White Horse Rapids and Miles Canyon on Lewis River, one of the large tributaries which in conjunction with the Hootalinqua River and Pelly, form the Yukon River. A route on the west side of Lewes River running from the entrance of Miles Canyon to the foot of White Horse Rapids afford the short-

light steel rails. For the present, however, the wooden track serves the desired end very satisfactorily. Construction was necessarily expensive, as laborers' wages were \$7 per day and supplies cost 50 cents per pound to freight in from Skaguay. This year, however, owing to the White Pass railroad and steamers on the lake, freighting is 80 per cent. lower. The rolling stock consists of 30 cars and 50 head of heavy horses.

#### Railroad Track in Tunnel.

In the April number of the *Revue Générale des Chemins de Fer*, Mr. Michel takes up the subject of laying track in tunnel and contends that as a general proposition it is cheaper and more satisfactory in maintenance to put the rails on stringers than on cross ties. Ordinarily, the section is such that the inverted arch of the tunnel is about a yard below the base of the rail. This space must be filled with ballast and the drainage channel is very difficult to inspect and maintain, particularly in a single track tunnel.

The maintenance of the track itself is difficult because of the darkness and the cramped space in which the men must work. The track is seldom well lined and surfaced, and the joints in particular deteriorate fast. Furthermore, the corrosion of the metal is a serious matter. The St. Gothard Company has taken out the metal cross ties, replacing them with wood. The renewal of the ballast is, of course, a difficult and expensive process.

On the contrary, if the track is laid on stringers without ballast, the section of the tunnel can be reduced somewhat, as the space needed below the base of the rail may be reduced to 15 or 20 inches. The rails laid on stringers, if properly laid in a suitable bed, will hold in surface better than on cross ties in ballast, and the joints particularly can be better kept up. Mr. Michel cites the case of the Forth bridge and of several recent London tunnels. He might also have used the example of the St. Clair tunnel, where the rails are laid on cross ties, but these in turn rest on stringers which are laid on cement, and there is no ballast.

#### A Fallacy in "Trusts."

If merely legitimate trade development were the purpose of these huge combinations it would seem to be a necessary feature of them that their organizers and managers should be chiefly, if not solely, men skilled in the particular trade affected—men who had been trained and brought up in the business. It would seem, moreover, equally natural and logical to expect that such organizations, if intended simply for the development of trade according to modern ideas on strictly economical lines, should be perfected in their offices and factories and not in the resorts of speculators and stock manipulators. It would also seem reasonable to suppose that if they were got up simply to enhance the value of the individual properties included in the combination, the lucky owners of these properties would be glad to remain in quiet possession of their plant and increasingly productive business, and that the last thing they would think of would be to surrender a part of their prospective earnings to outsiders and the public generally.

The promoter of the combines, trusts and syndicates of recent growth is almost invariably an expert Wall street operator and nothing more, utterly ignorant of the practical operations of any trade save that of stock manipulation, and with as little consideration for the future of the industry which he undertakes to organize as for the interests of the consumers of its products. It is primarily, if not exclusively, his business to enrich himself and those associated with him at the public expense.

To find the way to turn out a better product of industry for less money than before is quite outside of the range of the gentlemen who are chiefly responsible for the recent astounding increase of vast agglomerations of manufacturing enterprises. It would appear to be obvious that if the experience and intelligence of practical men dominated these combinations there would be a very close appraisal of the value of their constituent parts, and a considerable amount of care to provide for every dollar of stock a solid basis of some description of valuable property. That would be the natural rule to be followed by any set of men engaged in perfecting an organization in which they expected to remain, and of the consequences of whose success or failure they alone would be sensible. But the preposterous over-capitalization of most of these enterprises reveals the kind of intelligence that presides over their formation, and the quarter from which profit is expected to come to the organizers. It may be difficult to say at what precise point the deliberate exaggeration of the value of any commodity assumes the character of a fraud, but it is not at all difficult to predict that the man who holds a mass of securities on which he knows that a purely artificial value has been placed will take the first convenient opportunity to get rid of them.—*New York Journal of Commerce*.

The Germans are building a railroad in Eastern Africa some distance south of the British Uganda Railroad and through a country which is not precisely fitted for a health resort. A certain number of employees are needed for this line, and as an indication of the inducements offered for men to take their lives in their hands and bury themselves in African jungles, the following may serve: An engineer qualified to assist in location and in charge of earthworks will begin at \$1,125 a year; a station-master at \$1,000; a locomotive engineer at \$900. All must be unmarried, aged between 25 and 35, and physically fit for service in the tropics. A certain provision for the outfit will also be made.





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#### EDITORIAL ANNOUNCEMENTS.

**Contributions.**—Subscribers and others will materially assist us in making our news accurate and complete if they will send us early information of events which take place under their observation, such as changes in railroad officers, organizations and changes of companies in their management, particulars as to the business of the letting, progress and completion of contracts for new works or important improvements of old ones, experiments in the construction of roads and machinery and railroads, and suggestions as to its improvement. Discussion of subjects pertaining to ALL DEPARTMENTS of railroad business by men practically acquainted with them are especially desired. Officers will oblige us by forwarding early copies of notices of meetings, elections, appointments, and especially annual reports, some notice of all of which will be published.

**Advertisements.**—We wish it distinctly understood that we will entertain no proposition to publish anything in this journal for pay, EXCEPT IN THE ADVERTISING COLUMNS. We give in our editorial columns OUR OWN opinions, and those only, and in our news columns present only such matter as we consider interesting and important to our readers. Those who wish to recommend their inventions, machinery, supplies, financial schemes, etc., to our readers, can do so fully in our advertising columns, but it is useless to ask us to recommend them editorially either for money or in consideration of advertising patronage.

During the month of April we noted in our news columns orders for 5,523 cars. Of this number 516 were gondola, coal and ore cars; 4,112 were box, stock, furniture and refrigerator cars; 150 were flat cars; 550 were large capacity steel cars, and 195 were passenger and street railroad cars. Orders for 267 locomotives were also noted, of which 114 were ordered for export. Of the 267 engines, 78 were for passenger, 145 for freight and 44 for switching service. Compared with the orders for the month of March, noted in our issue of April 7, of 21,667 cars and 541 locomotives, the record for April shows a marked falling off. One explanation that is given for this decrease in orders is that many roads are holding back their orders until the crops are safe. The difficulty in getting early deliveries is another reason that has been given for not placing further orders just now.

Huxley once said that he had spent 40 years trying to make difficult things plain. To that he attributed whatever of merit there might be in his literary style. The exact quotation escapes us now, but that is about the sense of it. The distinguished President of Stevens Institute of Technology, Dr. Henry Morton, has had the same sort of experience. Moreover, like Huxley, he believes that "there is no alleviation for the sufferings of mankind except veracity of thought and action;" and he has taken a good deal of pains, one time and another, to hunt out and expose unveracity and incompleteness of thought. Thus, he has become in some measure a specialist in exhibiting "engineering fallacies" to the young men under his charge, and incidentally to a larger public. One of the neatest jobs of this kind that he has done is an analysis of some of the claims made for Mr. Tripler's liquid air. He shows by beautifully simple reasoning and clear statement that (1) Mr. Tripler "requires to make a gallon of liquid air twelve times as much power as a gallon of liquid air could possibly develop in an ideally perfect engine; and (2) that an apparatus to develop mechanical energy from the heat of the atmosphere would be of impracticable size and its friction would probably use up a large part of the power it could develop; and (3) on Mr. Tripler's own showing his power will cost him 26¢ cents a horse-power-hour, against from one cent to four cents per horse-power-hour for a steam engine.

The remarks printed on another page from a general manager and eight yardmasters make entertaining and we hope instructive reading concerning the freight car coupler. It is somewhat astonishing to see how large a majority of the yardmasters say that link and pin couplers are safer than the M. C. B. coupler. They give their experiences, however, in sufficient detail to make plain the fact that the dangers of the M. C. B. coupler are not inherent in the type, but are from faults

of design, of make or of maintenance. In other words, they are dangers which railroad officers can control and correct. When we say railroad officers we do not mean alone the officers of the mechanical departments, for unfortunately they can only begin the work of straightening out this miserable situation. They must be backed up by the general manager or whatever officer controls purchases. The main point is to lay down standards of lines, of materials, of minor working details and of allowable wear, and stick rigorously to these standards. The great trouble is that the railroads have permitted the makers of couplers to unload upon them a great deal of badly designed or badly made trash. It is reasonable to think that something will happen at the next convention of the Master Car Builders' Association, which will be extremely disagreeable to some coupler makers and very agreeable to those who are confident of their power to fill reasonable requirements and who wish to be permitted to do so.

We seem to be almost upon the time when freight of some kinds can be taken from Chicago to the Atlantic seaboard cheaper by rail than by water, if, indeed, the time is not already here. This would have been looked upon by most people as impossible even as late as five years ago. The present competition between the rival railroads can hardly be described as cut-throat warfare—the kind wherein each road determines to carry freight at a decided loss rather than see it taken by a competitor; and it seems fair to assume, therefore, that practically all of the very low rates which are now being made are at least a trifle above cost. The conditions now existing are described by a Chicago correspondent as follows:

Lake navigation having opened, shippers are figuring to see which is the cheapest, lake and rail to the seaboard or all rail. Shippers claim that the twelve-cent rate on export oats from Chicago to New York is cheaper than by lake and rail. They are, accordingly, sending most of their business that way. There is also more corn than has been known for years going all rail, especially to Baltimore and Philadelphia. Last week and the previous week saw more corn and oats contracted for to be moved out of the Northwest, all-rail, than has ever been taken at any one time. The Chicago, Milwaukee & St. Paul and the Chicago Great Western secured several million bushels. It was brought here and turned over to the Pennsylvania by the St. Paul, and to the Lake Shore by the Great Western. The Lake Shore has within two weeks contracted for 3,000,000 bushels oats to New York at 12 cents. This is in addition to the large amount taken by the Wabash and the Erie the previous week. Roads that were not sharp enough to make a rate to take the grain have not secured anything worth mentioning.

Twelve cents per 100 lbs. on oats is equal to 3.84 cents a bushel, a rate which would afford very unsatisfactory divisions to the three or four interests (the vessel, the Buffalo elevator, and the canal boat or railroad east of Buffalo) which would have to have a share in it if the freight were sent by lake. In the case of grain sent to the ports south of New York it is to be borne in mind that the railroad company's interest in the vessel which carries the grain to Europe may have an influence in making the rate lower than it would otherwise be.

In the last issue of "The Engineer" (London) which we have received appears an editorial article entitled "English Engineers and American Bridges." It seems that there is quite bitter complaint that the civil engineers of Great Britain are driving trade out of the country and accepting from the United States, "or anywhere else, what they would not dream of taking from an English or Scotch firm." The editor remarks that his own experience confirms these statements, but that he is obliged to respect the reticence of those who suffer. He thinks that it has been said with truth that the civil engineer never makes anything but an income; all engineering works are made by the contractors. It appears that the engineer sits quietly in his office and puts his young men to making estimates and drawings, and that he has never set foot inside a steel works; he only knows in a general way how steel is rolled. A case is cited in which the engineer specified that bars for a large lattice bridge should be rolled to one-hundredth of an inch. It seems that the civil engineers of Great Britain regard mechanical engineers, iron masters and bridge builders as rogues, who will cheat if they get a chance. Thus the British manufacturer is tied and bound, hand and foot, by rigid specifications and exacting inspectors, while American bridges, locomotives, engines, etc., are accepted on the reputation of the makers. We regret that we are not prepared to answer by the book these very grave charges against the civil engineer of Great Britain, but we venture to say that they are mostly nonsense. It is quite possible that British engineers have sometimes been arrogant and uncompromising and that they have sometimes treated the contractors and the

steel makers with scant courtesy and even with unreasonable severity. Such cases are found on both sides of the water, but we cannot think that the civil engineers of Great Britain are a set of inflated and incompetent bigots who never go inside the steel works and who have no actual knowledge of how things are done in the world. This would be unlike the British way of doing things and we cannot imagine that men who have accomplished so much in the world as the civil engineers of Great Britain have accomplished, can be the sort of people described by the editor of "The Engineer." At any rate, if he will come over to this side of the water he will find that contractors often complain of the specifications and inspection of the bridge engineer; but he will also find when he gets at the bridge engineer that he is well versed in the details of steel making, from the melting furnace to the finishing rolls, and we judge that the civil engineer in England must be a good deal the same kind of a man. The really practical point, however, of "The Engineer's" editorial is that the specifications presented to the bidders should be much more general than they ordinarily are in England and that the contracting engineer should be left with a freer hand. It is quite possible that this is good advice.

#### Street Cars and Public Service.

Public attention is easily attracted by anything that promises to affect rapid transit in New York, but there is another phase of this important matter which is worth the attention of the intelligent citizen. We should never lose sight of the short distance travel. The great majority of those who use the urban railroads of New York City ride but short distances—a few blocks, or at most a mile or two. This movement is incessant; it goes on all day, up and down Broadway, and the great avenues, and across the city. The Broadway travel never ceases during business hours and hardly ever flags. The business on the avenues fluctuates in volume and in locality according as the suburban business men and women are coming and going, or as the shoppers become more or less active, or with the opening and closing of the theatres. To best satisfy the needs of this shifting traffic, to develop new traffic or to swell the volume of the old, we must discover and meet these needs.

To discover the needs of those who move about in the city of New York, or in any other great city, is a matter of theoretical study and of actual experiment. To meet them involves not merely a well adjusted system of transfers, but an adequate car service. An adequate car service implies not only running enough cars, and running clean and attractive cars, and running them at reasonable speeds, but it involves the intelligent routing of cars. Obviously, anyone would rather make a continuous journey than to transfer; and that the greatest possible number of people may make continuous journeys, cars must be run from the ferries and residence districts to the office districts during some hours; from the ferries and residence districts to the shopping region during other hours, and to points convenient to the theatres during still other hours. These examples suggest what we mean by intelligent routing of cars, and just this is what some of the most successful street railroad officers are trying to bring about. One of the problems of the modern street railroad manager is to secure such flexibility of equipment as will allow routing of cars according to the needs of the hour.

It is obvious that flexibility can only be attained by uniformity of motive power and equipment or by making each car self-contained and independent of a central source of power. Now we begin to see one great reason why the public will gain by a change from cables to electricity on such great lines as are still worked by cables, and why the public is deeply concerned, further, in the possible development of a good, independent mechanical motor which would permit any car to run anywhere. This indeed is the really important matter in connection with the trials of cars propelled by compressed air engines which will be made in New York City.

There are mechanical and financial reasons which may long delay the electrifying of many crosstown lines and of some north and south lines. The underground electric conduit system is costly, and at crossings and junctions it is very costly. On a great north and south line, running straight away, where the interest on the first cost is divided by a large car mileage, the cost of building is relatively unimportant. On a crosstown line, where the car mileage is moderate and the crossings and junctions are many, the cost of building may be prohibitive. In a place like West street in New York, for ex-



ample, where the ground is low, the frequent flooding of the underground conduit would make operation costly and sometimes difficult.

These are some of the reasons why the public of the city of New York is deeply concerned in the probable or possible development of a mechanical motor which shall make the individual car independent of any common, central source of power. There are many other great cities in the country where the overhead trolley wire is not now permitted, or where the public will soon demand its removal, in which some of the conditions of New York are repeated.

It is not worth while to enter here into the history of the compressed air motor for street railroad uses or into the present mechanical state of its development. It is enough to say that compressed air motors have long been a staple product of several of the builders of locomotive engines and compressed air motor cars are considerably used in Paris and other French cities, and have been for some years, and the cars to be put in service in New York City are mechanically considerably the best designed of all those that have yet appeared. Therefore, there is reasonable ground to look upon this experiment as serious, and to look for its mechanical success.

We need not at this moment go into the question of the possible danger of carrying a stored pressure of 2,000 lbs. to the square inch under the seats and floors of these cars. The control and safe use of such pressures is a mere matter of engineering care and skill, and it must be remembered that compressed air once stored on a car cannot increase in pressure, but must diminish. It is hardly supposable that the acute and enterprising gentlemen who are interested in the present experiment will be so short-sighted as to take any risk of destroying a carload of passengers and wrecking at the same time the prospects of their enterprise and destroying the results of investments already large. On the whole, therefore, the public may sit by and watch this interesting experiment with equanimity and with a fair hope that from it will come some gain in public convenience.

#### Annual Reports.

Lake Shore & Michigan Southern.—The twenty-ninth annual report of the Lake Shore & Michigan Southern Ry. Co. is issued this week, being for the fiscal year ending Dec. 31, 1898. The average miles operated were 1,410, being 27 miles less than in 1897, and in fact the least number of miles operated since 1889.

The gross earnings amounted to \$20,754,000, and increased over 1897, 2.25 per cent. The operating expenses and taxes amounted to \$13,928,000, or 67.11 per cent. of the gross earnings. The increase in this item was 2.85 per cent. The net earnings amounted to \$6,826,000, and the increase over the preceding year was 1.04 per cent. After paying fixed charges the surplus earnings amounted to \$8.13 per share of stock and a 7 per cent. dividend was paid, leaving \$561,000 to carry to the credit of income account. This is the first time since 1883 that a dividend has been paid at a rate as high as 7 per cent., although 6 per cent. has been paid for the last eight years. In 1883 and for three years preceding, the rate was 8 per cent.

The earnings from freight were \$14,023,000, and from passengers \$4,281,000. The freight earnings increased only about 2 per cent. and the passenger earnings about 0.8 of 1 per cent. The greatest increase was in the small item of "other sources." There was a trifling increase in the earnings from mails and a small loss in the earnings from express business. The wonder is that the freight earnings increased at all, although the ton-miles increased nearly 300 million. The receipt per ton per mile was only 5.02 mills, a decline of 8 per cent. from the rate of the year before, namely, 5.45 mills. Of course, it was the lowest rate ever recorded by the company. The cost per ton-mile fell to 3.29 mills, as compared with 3.56 the year before, and this again is the lowest cost ever recorded. The profit per ton-mile was 1.73 mills, as compared with 1.89 in 1897, 1.62 in 1896 and 1.51 in 1895. The least profit per ton-mile that we discover in the records is 1.26 mills in 1893.

Notwithstanding the persistent decline in the ton-mile rate the ton-mile profit compares now very satisfactorily with the profit of the last 10 years. This we suppose is largely the result of the immense improvements in the capacity for handling heavy loads, first in the improvement of the road itself and now, very recently, in more powerful locomotives and larger cars. The average freight train load last year showed a great gain, and it was already large. The average for 1898 was 352.4 tons; in 1897 it was 321.1; in 1896 it was half a ton bigger than in 1897, and in 1895 it was 318.5. A considerable jump came just about that period. For a number of years the load ran, year by year, anywhere from 252 tons up to 276, but in 1895 it was put well above 300 tons, below which it will probably never go again.

The passenger-mile rate, of course, does not fall so fast. Last year it was 2.095 cents per mile; the year before it was 2.018. Ever since 1870 it had been above two cents, except in 1881, when it was 1.988. While the passenger rate has fallen slowly for the last 15 years, the earnings per passenger train mile have declined somewhat faster, and the expenses have risen. The passenger train load has gradually fallen.

As a result of the whole movement the net earnings per mile of railroad in the last year were \$4,840, and this is greater than in any other one year since 1888, when the net per mile was \$5,008. Of course, the slow but persistent improvement in results in spite of falling rates is due to the larger volume of freight business and to the less cost of handling. The ton-miles gained slowly year by year, and last year they amounted to 2,771,978,098, which was a gain of about 300 million ton-miles over the preceding year. For six years the volume had stood practically constant, and for the 15 years following 1874 it had slowly risen, of course, with fluctuations.

It is hardly practicable now to go into an itemized study of the methods by which the cost of transportation on the Lake Shore has been reduced, and indeed the annual report alone would leave much to conjecture if we had no other knowledge. As compared with 1897 fuel for locomotives cost less in 1898, notwithstanding the greater ton mileage. Repairs to freight cars cost somewhat less, but new freight cars cost \$311,000 more, this being charged in to operating expenses. New locomotives cost over \$50,000 more, also charged to expenses. Altogether, maintenance of way and structures cost about \$70,000 less than in 1897, maintenance of equipment about \$40,000 more, conducting transportation about \$120,000 more, and general expenses about \$25,000 less.

Of course we need hardly repeat that the capital stock of the company has remained unchanged since 1871 at 50 million dollars. The construction and equipment account has not been changed since 1883 and stands at \$4 million dollars. The funded debt, of course, has materially changed by the refunding operations, bringing the old issues down to a 3½ per cent. basis. Up to the time of issuing the report the funded debt had been increased \$3,892,500, but the yearly interest saving amounted to \$735,910.

Mexican Central Railway.—The nineteenth annual report of the Mexican Central for the year ending Dec. 31, 1898, is received. In that year the average miles operated were the same as in 1897, namely, 1,956. The gross earnings were \$13,588,966, being an increase over the preceding year of \$743,000. The net earnings were \$4,427,534, the increase having been something over \$411,000. About half of the gain was in local freight business; another large item was local passenger business. The international freight and passenger business gained but little. This is attributed to three principal causes; namely, the war, which suspended regular sailings to Tampico, serious fevers for five months at Tampico and along the San Luis Division and unprecedented floods on that division which caused an absolute suspension of traffic for 21 days. It is estimated that by reason of these conditions the company lost in actual gross revenue at least \$500,000.

The gross earnings continue to increase steadily. The 13½ millions in the last year compares with 10 millions in 1896, eight millions in 1893, and 3½ millions in 1885. From 1885 to 1898 the increase in miles worked was 58.24 per cent.; in the same period the increase in gross earnings was 222.28 per cent. The gross earnings per mile worked rose in that period from \$2,859 to \$6,906, or 141.59 per cent.

The locomotive equipment stands the same as the year before, namely, 206 engines with 16,701,000 lbs. on the drivers. In 1890 the total was 139 engines with 8,619,000 lbs. on the drivers. The average weight of the engine therefore has risen from 62,000 lbs. to 81,000 in that time. Of course the total weight of engine and tender has risen correspondingly. At the end of 1898 the freight equipment was 3,813 cars with an average capacity of 22.95 tons per car. In 1880 this equipment was 2,650 cars of an average capacity of 16.48 tons. The tonnage capacity of the freight equipment has nearly doubled. It has been the policy for some years to replace condemned cars of 15 and 20 tons capacity by cars of 30 tons, charging the entire cost to operating expenses.

During the year reported on 4,572 ft. of wooden trestle bridges were taken out and the openings filled with earth; 4,645 ft. were replaced by cast iron culverts, 1,015 ft. by stone culverts and 1,984 ft. by iron structures, making a total of 12,216 ft. of wooden bridging replaced either by permanent structures or by diverting the drainage and filling with earth. The amount charged to operating expenses for bridge work in 1898 was \$486,159. The bridges are being replaced as far as possible with stone or steel, or where they are rebuilt in wood only creosoted material is used, at least doubling the life of the bridge. Since 1895, 29,216 lineal ft. of wooden bridging has been replaced.

The Ford franchise tax bill, providing for laying additional taxes on certain corporations, was passed by the New York State Legislature on the last day of its session and is now before the Governor for his signature. This bill, which was described in the

Railroad Gazette of March 17, page 190, was introduced early in the session, but was not the subject of much discussion until the Legislature was nearly ready to finally adjourn. Many members had doubts as to the effect which the proposed law would have, and it is said that a considerable number of those who finally voted for it did so against their own judgment, deeming the passage of the bill a political necessity. Governor Roosevelt, being convinced that, to meet the reasonable demands of a majority of the people, additional taxes should be laid on street railroad corporations, sent a second message to the Legislature urging the passage of this bill. In terms, the bill simply enacts that, in the tax law, the term "real estate" shall include the value of franchises of street railroads, whether on, above or below the surface; also all rights to the use of pipes, wires, etc., in streets. Corporation officers and others in New York City who are most likely to have made a careful study of the law, seem to be in doubt as to its probable effect, and they decline to express decided opinions concerning its justice or injustice. Municipal officials say that in any event the law cannot take effect in New York City until next year, and before that time it is quite possible that active measures will be taken to secure a modification of the law by the next Legislature. A railroad company operating a line in a street in a city is already taxed on its organization (one-eighth of one per cent.); on its real estate the same as though it were a natural person; on its capital stock, less investments in real estate and in shares of corporations which have already been taxed; on surplus profits exceeding 10 per cent., and there is a state tax on dividends, which applies in a modified form where no dividends are paid. Moreover, certain of such corporations working steam railroads pay one-half of one per cent. annually on their gross earnings. Where municipal franchises are periodically resold to the highest bidder there is a further annual tax to the city, generally based on gross earnings. As we observed in discussing this bill two months ago, the peculiar vice of a law of this kind is the added complication which it introduces. The present uncertainty in the minds of the legislators, the experts and the officers of the companies most likely to be affected is almost sufficient to condemn the law; for in so important a feature of government as taxation, directly affecting, as it does, nearly every citizen, simplicity and comprehensibility are, or should be, prime essentials. Perhaps the Governor, by means of the inquiry which he will make before signing the bill, will be able to make clear the probable results of the operation of a law of this kind.

The New York Central & Hudson River Railroad has now taken over the West Shore completely, incorporating its operating divisions west of Albany into those of the Central proper and making the line south of Albany the "West Shore division" of the Central. At the same time the lines controlled by the Central south from Lyons and Geneva are taken over in the same way, so that the Central proper, now managed by one general superintendent, Mr. Van Etten, comprises 2,807 miles of road. Mr. Van Etten is also General Superintendent of the Dunkirk, Allegheny & Pittsburgh, so that his entire territory is 2,898 miles. This includes everything controlled by the Central east of Buffalo and the Niagara River and also the 91 miles of the D. A. V. & P., which is separated from the Central by the 40 miles of the Lake Shore road between Buffalo and Dunkirk. The lines south of Lyons are called the Pennsylvania division. The changes in officers, so far as announced, are given under the head of appointments, in another column of this paper. This more complete absorption of the West Shore is followed by further changes in the running of trains for the purpose of best economizing power and making the most advantageous use of facilities. Superintendents Bradfield, at Buffalo, and Harrington, at Albany, will each operate his two main lines as one six-track railroad, except that all trains which do local work will continue to run as heretofore so as to stop at the same stations. A through West Shore passenger train will be run over the New York Central if that is found to be the best way to run it. Through freight from the West for New York will be diverted to the West Shore as much as possible and be run down the west side of the Hudson River instead of the east side. This will relieve the Hudson division, which is not four-tracked, and also relieve the terminal yards in New York. The freight terminals on the west side of the river will have to be enlarged, but we do not learn that the company has yet decided what to do with this part of the problem. The diversion of freight from the Central to the West Shore, already considerable in volume, is now done chiefly at Schuylers, east of Utica, but a freight connection, with a bridge, to obviate a grade crossing with the passenger tracks, is being made near Hoffmans, about 60 miles farther east. This connection is about a mile long and will not be finished for several months.

The report of the last meeting of the Railway Signaling Club, which is given in another column of this issue, indicates that interest in the yellow distant-signal lights of the New York, New Haven & Hartford is quite general. Letters which we have



received from railroad officers give additional evidence to the same effect; and Mr. Baird, of Boston, the maker of the glass, informs us that he has received experimental orders from a considerable number of roads, all of which would seem to show that sentiment in favor of substituting green for white as the night all-clear signal is widespread and strong.

### Electric Power from Windmills.\*

By Professor C. L. Crandall.

In estimating the cost of operating a small power plant the cost of attendance may form a large percentage of the total. It is this fact, the absence of a fuel account, and the low cost of maintenance proper, which allows the windmill to still successfully compete with other prime movers for small units.

The uncertainty in the supply is not very serious for pumping where storage can be provided and for

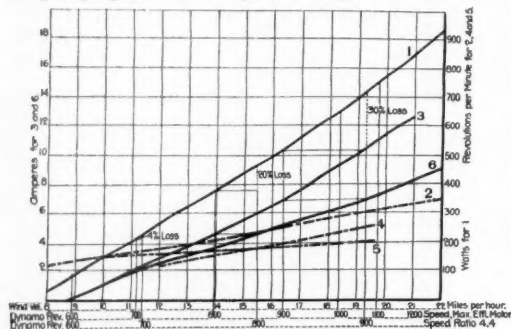


Fig. 1.—Data from Windmill Tests.

many other purposes. Its effect, however, is to increase the size of mill, and hence the interest and depreciation charges for a given service. This is especially the case for electric lighting where the cost for storage by a storage battery forms an important part of the total and increases rapidly with the storage capacity. On this account the following estimate of the daily lamp hours available for lighting with a  $\frac{3}{4}$ -k. w. dynamo and a 12-ft. aermotor may be of interest.

The power of the mill for different wind velocities is taken from the tests of a similar mill published by E. C. Murphy in the Engineering News, Aug. 19, 1897. He measured the wind velocity with an United States Weather Bureau anemometer registering each mile of travel, while the work was measured by means of a friction brake on the driving pulley at the base of the tower. Different weights were used on the brake, giving different velocities for a given wind velocity and allowing the speed for maximum efficiency to be obtained, as also an approximate value of the loss in power caused by a change in speed. This data is shown in Fig. 1.

Curve (1) gives the belt horse power of the mill multiplied by 746 or expressed in watts for different wind velocities in miles per hour when running at the speed for maximum efficiency. Curve (2) gives the corresponding number of revolutions of the belt pulley per minute, while (4) gives the revolutions approximately for a loss in efficiency of 20 per cent.

The motor is of the solid wheel type. The shaft of the wind wheel is eccentric by several inches with reference to the vertical axis of the turntable; it drives a parallel shaft, intersecting the turntable axis by a spur gear multiplying velocity 3 to 1; the parallel shaft drives a vertical shaft extending down the hollow axis of the turntable by a bevel gear

the turntable. The tension of the tail spring has a slight adjustment so that curve (1) can be modified somewhat for the higher winds.

The dynamo was tested by Professor Moler in the dynamo laboratory of Cornell University when charging a 27-cell storage battery having a voltage of 57 at the beginning of the test. The voltage and the charging and shunt field currents were directly measured. The total belt horse power was estimated, or rather the frictional and other losses, no means for measurement having been at hand.

The results of this test are shown in Fig. 2. The watts are given on the right and the voltage on the left, both in terms of the speed of rotation of the dynamo.

The dynamo is differential wound, the main current reducing the strength of the field produced by the shunt current, which accounts for the slow rise in voltage and horse power with velocity.

By equating belt horse power of dynamo and motor the dynamo revolutions can be plotted in Fig. 1, as also the corresponding charging current, giving both in terms of wind velocity. A test of the 16-candle lamps to be used showed them to take 0.78 ampere of current at 52 volts. Accordingly it is assumed that one ampere of charging current at 56 volts would be required per lamp supplied by the storage battery, allowing for battery and line wire efficiency. Accordingly the charging current for Fig. 1 (3) is given in amperes or in lamps (at the left edge of the plate).

By dividing the dynamo revolutions by the motor belt wheel revolutions for maximum efficiency, it is seen that the quotient is not constant; thus,

$$\frac{600}{133} = 4.5; \frac{700}{170} = 4.1; \frac{800}{216} = 3.7; \frac{900}{253} = 3.5; \frac{1,000}{286} = 3.5;$$

$$\frac{1,100}{310} = 3.5; \frac{1,200}{333} = 3.6$$

Efficiency for light winds being of most importance, a ratio of 4.4 was assumed. (This was afterwards reduced to 4.2.) By dividing the dynamo revolutions, 600, 700, etc., by 4.4, the corresponding revolutions of the motor pulley are obtained, curve (5). A comparison of (5) with (2) shows a considerable slowing down of the motor for high winds. This by (4) gives an estimated loss of 4 per cent. in the power of the motor at 700 revolutions of the dynamo, 20 per cent. at 800, and 30 per cent. at 900 revolutions, giving (6) as the best approximation to the actual available current in terms of wind velocity which can be obtained from the data.

The amperes of this current give the number of 16-candle lamps which can be supplied through the storage battery for different wind velocities according to the assumptions made.

The next step is to find the wind velocity available day by day in order to find the capacity of the plant. This velocity is taken from the sheets of the self-recording Richard Frères anemometer of the New York State branch of the United States Weather Bureau at Ithaca. The anemometer is on the top of the McGraw tower, some 140 ft. from the ground, with the surrounding country for several miles generally lower except to the east, where it gradually rises. The recorded velocity curve is continuous, the co-ordinates being time and distance.

For each day the number of hours for each wind velocity is multiplied by the number of lamps for that velocity taken from curve (6) Fig. 1, and the products added for the lamp hours for that day. In Fig. 3, these sums are plotted for the year beginning July 1, 1897. Lines are drawn on each plate showing the inclinations for 10, 15, 20, 25 and 30 lamp hours per day, so that the general inclination of the curves in lamp hours can be estimated for any period. If, for example, the dotted line in

as they occur when the full lighting capacity is required.

A similar computation has been made for a 16-ft. aermotor running the same dynamo on the assumption that the power increases as the square of the diameter up to the capacity of the dynamo, or to a current of 12½ amperes at 56 volts. With these curves and the same storage capacity of 120 lamp hours, the May minimum was brought up to 19 lamp hours per day and the time shortened to the two weeks from May 22 to June 7. The October minimum was raised to 29 lamp hours for 10 days, the November minimum was raised to 35 lamp hours for 22 days and the February to 32 lamp hours for the same two weeks.

The 12-ft. aermotor has thus a minimum capacity under the conditions assumed of 19 lamp hours (16-candle power lamps) per day during the season of maximum lighting and the 16-ft. a minimum capacity of 35.

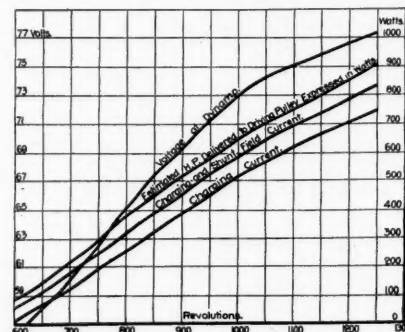


Fig. 2.—Test of Dynamo Driven by Windmill.

Increased storage capacity would appreciably increase the capacity with the 16-ft. aermotor, while it would have but slight effect with the 12-ft.

### TECHNICAL.

#### Manufacturing and Business.

The Shearer-Peters Paint Co., Cincinnati, O., reports that its business has greatly increased since March, 1898, when Mr. C. W. Peters became connected with the company. The Shearer paint has been on the market about fourteen years. Recently 40 agents have been appointed and seven branch factories have been established in various parts of this country, while several European orders have been received. It is claimed that a special paint for such surfaces as furnace fronts and stacks, locomotive stacks and front ends, and where the work is exposed to acid gases, has given remarkable results.

Manning, Maxwell & Moore (also the Ashcroft Manufacturing Co., Shaw Electric Crane Co., Consolidated Safety Valve Co., Pedrick & Ayer Co., and Hayden & Derby Manufacturing Co.) have moved from Nos. 111 and 113 Liberty St., to the new Singer Building, 85, 87 and 89 Liberty St., corner of Broadway, New York. The new quarters are large and convenient. The ground floor will be devoted to show rooms and the first floor will be occupied entirely by the business offices. A central telephone desk will give the firm direct telephone connection with all of its factories and with every department of the business.

H. H. Maus & Co. have removed their offices to 420 Walnut St., Philadelphia.

The Melan Arch Construction Co. has removed its offices in New York City to 13-21 Park Row.

The Intercolonial Railway, of Canada, will, this

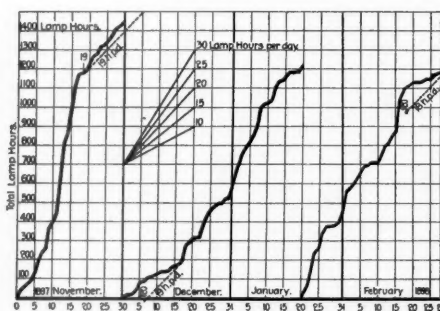
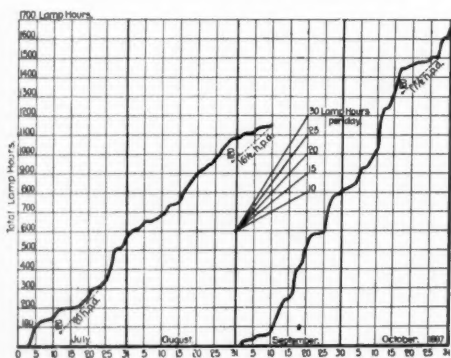
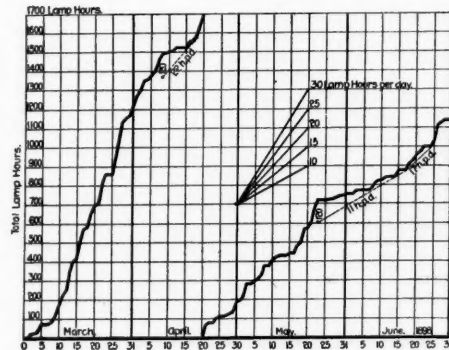


Fig. 3.—Lamp Hours for Electric Lights Receiving Power from Windmills.



multiplying velocity 2 to 1. The vertical shaft drives the belt pulley at the bottom of the tower by a bevel gear without changing the velocity. The wheel is held into the wind by a spring extending back to the tail bone of the vane and by the torque of the vertical shaft; it governs out by the eccentricity of the wind pressure upon the wheel with reference to

\*The substance of this paper was presented at the Boston meeting of the American Association for the Advancement of Science. Requests for more information than was contained in our brief abstract at the time, has led to the preparation of this paper, which gives the lamp hours a day available for electric lighting from a storage battery plant driven by a 12-ft. aermotor.

July marked "20 h. p. d." be compared with the small diagram it will be found to be parallel to the line marked "20;" the 17½ line in October will be found to lie midway between the 15 and the 20 line of the small diagram. Lines are also drawn showing minimum supplies in periods of calms for an assumed storage battery capacity of 120 lamp hours. The lowest for the year is 11 lamp hours per day from May 19 to June 17, or nearly a month when the evenings are shortest. The 17½ hours for two weeks in October, the 19 hours for nearly a month from Nov. 19 and the 18 hours for about two weeks in February fix the real limits of the plant for the year

year, spend \$20,000 for air brakes, and \$5,000 for new machinery for the shops at Moncton. Fifty thousand ties are required, and tenders will be asked for at once for 5,000 tons of rails.

The Prince Edward Island will shortly ask for bids for 1,000 tons of rails.

Improved Michigan triple locomotive lubricators with automatic steam chest plugs, made by the Michigan Lubricator Co., Detroit, Mich., have been specified for two engines recently ordered by the Chesapeake & Ohio from the Schenectady Locomotive Works. The same lubricator will also be ap-



plied to some engines being built by the Rhode Island Locomotive Works for the Wabash.

#### Iron and Steel.

A charter has been granted to the Diamond Steel Co., of Wilmington, Del., with a capital of \$3,000,000. It is understood that the Diamond State Iron Co. will be absorbed by the new company.

#### New Stations and Shops.

The Intercolonial of Canada will spend \$15,000 this year for enlarging engine houses.

The Chicago Great Western will, during the year, extend four engine houses and build five power coaling stations.

A new Union passenger station at Grand Rapids, Mich., is contemplated by the Grand Rapids & Indiana, but nothing has been decided upon.

#### The Traveling Engineers' Association.

The Traveling Engineers' Association has issued a circular letter asking for information as to the responsibility of engine men working under the system of pooling locomotives. The Committee of which Mr. W. G. Wallace, Baraboo, Wis., is Chairman, would like to know for what things the enginemen are held responsible by different roads, how unfair usage of the locomotive is traced to the proper source, how tools are accounted for, who cleans the engines, and whether the pooling system is a success.

Mr. Hugh Montgomery, Waseca, Minn., Chairman of the Committee on "Boiler Compounds," would like information as to the methods used in washing out boilers, how often boilers are washed, how different boiler compounds and purges are used and their cost, and the effect of different treatments of boiler water on the life of flues and fire boxes.

#### The Schenectady Vandalla Locomotives.

Last week we showed the fast passenger engines lately built by the Schenectady Locomotive Works for the Vandalla Line. Since the publication of that description we have received details of the run of two of these engines from Indianapolis to East St. Louis on April 21st. The train consisted of one express car, one combination car, one coach, one dining car and one sleeper. The running time was as follows: Indianapolis to Terre Haute, 72.5 miles, 83 minutes, 52.41 miles per hour; Terre Haute to Effingham, 67.6 miles, 67 minutes, 60.54 miles per hour; Effingham to East St. Louis, 97.4 miles, 113 minutes, 51.71 miles per hour; the total run, Indianapolis to East St. Louis, 237.5 miles, four hours and 33 minutes, 52.2 miles per hour.

#### The High-Speed Brake.

We published last week a very interesting report by a committee of the Air-Brake Men's Association on the high-speed brake. In that report the statement was made that this brake is now used on only about half a dozen of the fastest express trains of the United States. So far as we can learn the following is a list of those trains now using this apparatus: The Empire State Express, of the New York Central & Hudson River RR.; the Congressional Limited, of the Pennsylvania RR.; the Black Diamond Express, of the Lehigh Valley, and the Cleveland Flyer, of the Cleveland & Pittsburgh Division, Pennsylvania lines. The Chicago, Burlington & Quincy has recently equipped seven engines with this apparatus, presumably for the fast mail service now attracting so much attention. The Chicago & Northwestern has recently equipped 12 engines, presumably for the same service. The Pennsylvania Co. has recently equipped two engines and 10 cars with the high-speed brake, but we do not know what trains this equipment is for.

#### Axle Lighting.

The Delaware, Lackawanna & Western has closed a contract with the National Electric Car Lighting Co. for the equipment of 15 passenger coaches with electric axle light. These cars are building by Barney & Smith, and are for Suburban service. The company has made a contract with the Atchison to equip 34 more cars, which will make a total of 122 running on that road. Five of the new cars will run between Galveston and Houston. The company has recently equipped the Illinois Central business car No. 2, now on a trip to Mexico, and the private car "Emmalita" of Mr. George Crocker, Vice-President of the Southern Pacific. The latter car recently went from New York to San Francisco with electric light all the way and power to spare to run electric fans.

#### New Axle Plant.

Work has been begun on the plant in West Homestead by the Carnegie Steel Co., Ltd., at which heavy car axles will be made, and to which the axle business now done at the Lower Union Mills of the company in Pittsburgh will be transferred. The steel will come from the Homestead Works, about one mile away. The main building will contain the heating, forging, annealing and turning departments, and there will also be buildings for boiler house, engine and dynamo, pumps, testing shop, machine shop, smith shop, offices, etc., all of brick and steel construction. Outside the hydraulic charging machines practically all apparatus will be driven by electric power, including 32 Belmont-Miles lathes. It is claimed that the plant will

be the largest of its kind in the world, having a capacity of 80,000 to 100,000 tons of axles a year. It is hoped the plant will be in operation within six months.—Iron Trade Review.

#### Atlantic and Columbia Type Locomotives.

Since 1893 the Baldwin Locomotive Works has built 18 locomotives of the Columbia type and 90 of the Atlantic type, not counting engines now building. Although some of the Atlantic type have been simple engines, a large proportion of them have been 4-cylinder compounds.

#### Bridges for Manchuria.

The newspapers announce that the Phoenix Bridge Co. has received a contract for 12 bridges for the Chinese Eastern Railway. The fact is these bridges have been in hand for some two months and will be shipped within the next month. The work was secured in general competition and was placed with the Phoenix Company, largely on account of prompt delivery. The company now has in hand orders for Russia, Japan, Mexico, South America and Central America.

#### Compressed Air for Japan.

Mr. Fugita, a civil engineer of Japan, recently visited New York, and among other matters looked into compressed air as a motive power for street railroad purposes. On his way back he has been intercepted in Chicago by the acute representative of the Associated Press, and he is reported to have said that he will leave orders in this country for machinery to equip the street railroads of Tokio with compressed air, and further, that compressed air is especially adapted to the streets of Tokio and that he looks upon compressed air as the ideal motive power. We are not informed as to what Mr. Fugita did in New York, or of the arrangement that he has actually made for introducing compressed air motors for street railroad service in Japan. About a year ago, more or less, some official action was taken by the City Government in Tokio for equipping the railroads of that town with compressed air motors. This, however, was held up through the agency of certain engineers in order that electricity might be more carefully looked into. We suppose that the question is still open and that neither one power nor the other has been adopted. It is quite possible, however, that a considerable trial equipment of compressed air motors may be sent to Tokio.

### THE SCRAP HEAP.

#### Notes.

The Southern Pacific is experimenting at Sacramento with an apparatus for burning weeds, which has been devised by J. C. Martin, Road Foreman of Engines.

The Pennsylvania Railroad has bought all the land between its Market street and Federal street ferry houses in Camden, N. J., and, it is said, will build a large new building to accommodate the business of all its passenger boats landing at Camden.

The Upper House of the Wisconsin Legislature has rejected the Orton railroad tax bill, which had passed the Lower House. The bill made no change in the method of taxation, but proposed to make a large increase in the rate. The Atkinson railroad tax law, recently passed by the Michigan Legislature, has already been the subject of a decision by the Supreme Court of the State, which, it is said, makes the law wholly inoperative.

On April 25 press despatches were sent from New York over the wires of the Western Union Telegraph Co. by one operator to 38 cities at once, these cities being distributed over 6,001 miles of line. This was kept up for several hours. Among the cities receiving were Chicago, New Orleans, Philadelphia, Pittsburgh, Cincinnati, Atlanta, Memphis, St. Louis, Kansas City, Omaha, Denver and San Francisco.

#### Lake Commerce.

Dispatches from Mackinac, April 27, announced that the straits were open and that the first boats of the season had passed through, the ice encountered being so soft as to offer little resistance. Insurance rates on hulls for the season of 1899 are from 4½ to 5 per cent. on steel vessels of the highest class, against 3 per cent. last year. As a result of this increase in the tariff, it is probable that many of the best boats, such as the steel steamers and barges of the Federal Steel Co., will go out without insurance. The winter grain fleet, which commenced leaving Chicago April 27, and which is now arriving at Buffalo, consisted of 76 vessels, carrying 5,695,000 bu. of grain, of which more than one-half was corn. Most of this grain had been on board over two months. The Lake Michigan & Lake Superior Transportation Company's season opened April 29, when the steamer City of Traverse sailed from Chicago for Duluth.

#### Mexican Harbor Works.

At the port of Vera Cruz the protection works have been completed. The steel pier and the pier of the Inter-Oceanic Railroad have also been completed, so that there are now at the port in question four piers with nine meters of water alongside. Eighty per cent. of the area of the bay has been dredged to that depth, and 60,000 square meters of land reclaimed from the sea have been laid with sand and earth. The Government pier at Frontera has been completed, and is now in use. At Progreso the pier of the Merida-Valladolid Railroad, with branch to that port, has been extended. At Mazatlan about 230 meters more of the wall have been built. The lighthouses erected on the islands of

Santaguilla and Arcas are in service. The illuminating apparatus of the lighthouse on the Isla de Lobos has been changed. The necessary reconnaissances have been completed for the establishment of a light at Puerto Angel.

#### The Cape-to-Cairo Railroad.

In the House of Commons, May 1, the Chancellor of the Exchequer announced that the Government had failed to come to an agreement with Mr. Cecil Rhodes respecting the proposed guarantee to the Cape-to-Cairo Railroad. At a meeting of the British South Africa Co. Mr. Rhodes said that money will be raised by a 4 per cent. bond issue to build 750 miles, northward from Bulawayo. About \$15,000,000 will be borrowed.

#### Train Despatching by Telephone.

Train despatching has been done on the St. Charles Air Line at Chicago, for the last five months by telephone, during which time the despatcher has moved 11,664 trains without accident. The section of track thus controlled is less than a mile long, but the experiment appears to have been regarded as of sufficient interest to be carefully recorded. The use of single track on this line is temporary, during the changing of grade of the roadbed. It would appear that the messages are not written out in full, but are simply made the basis of the same kind of a record that is kept by block signal operators on single track roads. Mr. C. F. Annett, Assistant Superintendent of Telegraph of the Illinois Central, which road operates the St. Charles Air Line, says that he has used the telephone for train orders on two roads before he used it here, one of these roads being the Utah & Nevada, 40 miles long, where the telephone was in use from 1884 to 1890. No mistake was made during the six years. The other road was the Utah Central, Salt Lake City to Park City, 30 miles.

#### The Railroads and Foreign Commerce.

During the debate on the Prussian railroad estimates in the first week of March, Dr. Von der Borcht, who is known as the author of a considerable work on the economics of transportation, said: "When in the year 1876 a great part of the German manufacturers observed for the first time the situation in America, they were astounded at the resources of the country; but on the other hand, they believed that, because of the great distances there, it would hardly be possible for it, under ordinary circumstances, to compete with German labor. Meanwhile the North Americans have contrived to make German competition impossible; they are to-day the sharpest competitors of Germany in the world's markets, and chiefly because of low railroad freight rates, four great American railroads showing average rates per ton per mile of 0.35 cent to 0.98 cent., while on the Prussian State Railroads it is 1.34 cents.

#### Railroad Wages in Prussia.

In the Prussian Parliament the Minister in charge of the State Railroads said: "We go on the principle that the man employed on the railroads is entitled to such wages as are paid in similar employments in private industries." The result has been an increase of \$1,800,000 in wages in the last three years, while at the rates of wages paid in 1889, the amount paid in wages in 1899 would be some \$12,000,000 less than at the rates now paid, and it is now proposed to increase them \$2,000,000 more. Moreover, much else has been done to better the condition of the employees. Large sums have been appropriated for constructing dwellings for them, besides 2,500 dwellings built as an investment of the employees' pension fund. Provision has been made at many stations for accommodating trainmen when away from home.

#### Disorderly Passengers.

Among the most delicate and difficult tasks of a conductor is that of maintaining decent behavior among rowdies, especially drunken rowdies, and to do this he needs to feel confident that the authority of the law stands behind him. This seems to be appreciated in Germany, judging by the action of the criminal court in Darmstadt, before which were brought three masons, who while drunk, grossly insulted, "by word and deed," a guard who ordered them to leave a compartment reserved for ladies, and "resisted him in the performance of his official duties." One of these fellows, who had before been convicted of similar conduct, the court sentenced to 18 months' imprisonment, the second to 9 months and the third, who had used his tongue only, to 5 months. Will Darmstadt please lend us its criminal court?

#### Protect Your Banks by Bacteriology.

Presumably, railroad embankments in Austria are injured by field mice; for the Minister of Railroads found the damage they do of so much importance that in 1897 he sent directions to the managers of the state railroads and recommendations to the private railroads to make a thorough trial of the Löffler "mouse-typhus bacillus." The result is now reported to have been completely successful, especially when the holders of land adjacent to the right of way cooperated. The mice died of fever, we judge. But good results were also had when phosphorus pills were used.

#### Personal Damages.

Belgium holds the "record" for claims for personal damages, so far as known. In 1896 there was an accident at Bruges with many killed and injured. The state railroad authorities succeeded in settling for all the victims except two. The heirs of a great manufacturer at Lille, one Lesaffre, claimed \$550,000 damages for his loss. The court has recently allowed them \$10,000. Much more successful was Mr. Spaey, a lawyer of Ghent, aged 30, whose whole future life is made hopeless by a severe disease of the nerves. He wanted \$100,000 and got \$30,000.

#### Stealing Electricity.

In the Criminal Court of Cook County, Illinois, on April 17, Fred Potthast, a saloonkeeper, and Edward Bach, an electrician, were convicted, after a trial, of stealing current from the Chicago Edison Co. This is the first conviction under the Illinois statute relating to the fraudulent taking of current from the wires of another. The Chicago Edison Co. has had current stolen to such an extent within recent years that it has brought a number of suits, and several other cases will shortly be tried.

#### Railroad Fire Damage Law in Kansas.

The United States Supreme Court on April 17, in a Kansas case, sustained a law throwing upon the railroad companies the burden of plaintiffs' attorneys' fees in certain cases. The suit was that of the Atchison, Topeka & Santa Fe Railroad vs. Matthews & Truedell. The case came to the Supreme Court on a writ of error from the Supreme Court of Kansas and involved the validity of the act of the Kansas Legislature allowing the collection of attorneys' fees



from railroad companies in suits brought against them for damages by fire and in which it is proved that the fire was the result of the negligence of the companies. The state court affirmed the validity of the act and the opinion of Justice Brewer has now sustained that decision. The present decision was reached by a bare majority of the court, Justices Harlan, Brown, Peckham and McKenna dissenting. Justice Brewer, in his opinion, held that the statute must be affirmed on the ground that its purpose is not to compel the payment of debts, but to secure the utmost care on the part of railroad companies to prevent the escape of fire from moving trains. The Legislature was vested with the right to protect the state against this destructive agency and thereby subserve the general interest. The ground of the dissenting opinion, read by Justice Harlan, was that the real question involved was the right of a state to compel a railroad company to pay the fees of attorneys for plaintiffs in damage suits. It denied this right as a discrimination against a certain class and a denial of the equal rights guaranteed by the constitution.

#### Fast Runs on the C. B. & Q.

A fast run of the Burlington mail train on April 4 west of Creston was reported in the Railroad Gazette of April 14, page 268. Before that issue of the paper reached its readers a still faster run was reported on the Illinois section of the road, as reported last week. This was the eastbound train, and it made 64½ miles an hour for 197.3 miles. An officer of the road now sends us the record of a third run, being the westbound trip of April 23. In this case the train was 20 minutes late in leaving Chicago by reason of a delay in the eastern connection. The record is as follows:

Train No. 15, April 23rd, 1899. Class "H" Engine 1512, Engineer Kelley.			
Dis.	Dis.	Dis.	Left
Sta.	Sta.	Sta.	Dis.
8.5	8.5	15	Left U. D., Chicago, 6.58 P. M.
37.4	28.9	25	Passed Clyde 10.13 "
82.8	45.4	38	" Aurora 10.38 "
			Arrd. Mendota 11.16 "
			Left " 11.20 "
162.5	79.7	74	Arrd. Galesburg 12.34 A. M.
			Left " 12.36 "
205.8	43.3	39	Arrd. Burlington 1.17 "
205.8	191		

For the first eight miles the speed was limited by the condition of the track, a change of grade being in progress on that section. It will be seen that the total time for the 205.8 miles, including stops, was 199 minutes, equal to 62.05 miles an hour. From Clyde to Burlington, 197.3 miles, the average speed was 64.33 miles an hour, including the two stops. The Burlington fast trains are noted for regularity as well as speed. No. 7, running between Chicago and Council Bluffs, 500 miles, in 11¼ hours, has been late but once this year. No. 15, the train referred to above, scheduled one hour shorter time through, has failed to make its time on only four days since Jan. 1. It seems likely that the new engines, described in this issue of the Railroad Gazette, will make even better records than those here given.

#### Sale of Lake Coal Docks.

The Security Title & Trust Co., of Chicago, Receivers of the Pennsylvania & Ohio Fuel Co., sold the docks of that company at Manitowoc, Wis., April 28. The property consists of the Northwestern coal dock at Manitowoc, and the Wisconsin Central docks at Ashland and Duluth, and was bid in for \$106,100 by the Boston Coal, Dock & Wharf Co. The Wisconsin Central dock at Manitowoc was enjoined from sale by the United States Court until May 12th.

#### Technical Schools.

University of Minnesota.—The Board of Regents of the University of Minnesota has approved the plan of the Engineering College, which provides for a five years' course in the engineering departments. This course is one in which an engineering student may obtain more English and general culture studies, together with more science than is now presented in any of the regular four years' engineering courses. At the end of four years the student taking this course obtains the degree B.S. in Engineering, and if he should complete the fifth year the full engineering degree, M.E., C.E., or E.E. will be granted. This course does not in any way interfere with the present engineering courses, which will be carried on as heretofore, leading to the full engineering degree at the end of the fourth year; all of the subjects now included in any one of the present engineering courses is provided for in the new plan, which simply allows a distribution of the work over a more extended period, thus offering opportunity for additional literary and scientific study.

Johns Hopkins University.—The Electrical Engineering department of Johns Hopkins University is to be discontinued. The instructors feel that the course cannot be carried on properly with the present limited financial support. The course was established in 1886 and up to the last three years sufficient funds have been secured for maintaining a first class course. The resignation of Dr. Louis Duncan, formerly associate professor of electricity, now Consulting Engineer of the Third Avenue Railroad Co., of New York City, has been received.

#### LOCOMOTIVE BUILDING.

The Indiana, Illinois & Iowa will soon order from four to ten locomotives.

H. K. Porter & Co. are building one eight-wheel engine for the Montana Copper Co.

The Rogers Locomotive Co. has an order to build one locomotive for the Monterey & Mexican Gulf.

According to newspaper reports the Midland of England will place further orders in America for locomotives.

The Central New York & Western has ordered two consolidation engines from the Pittsburgh Locomotive & Car Works.

It is stated that the Dominion Coal Co. has ordered two switching engines from the Schenectady Locomotive Works.

The Hinton, New River & Western, now building, will buy some equipment. J. T. McCreery, Hinton, W. Va., is President.

The order for the two six-wheel switching engines for the Peoria & Pekin Terminal, referred to last week, has been placed with the Rogers Locomotive Co.

The St. Paul & Duluth has ordered three switching and two mogul engines from the Rogers Locomotive Co. and three Atlantic type passenger engines from the Baldwin Locomotive Works.

The Missouri Midland, a road now building, will in August place an order for one 40-ton double header locomotive. Charles Wiggins is President and Treasurer and Daniel B. Ely, Vice-President and General Manager, both Bank of Commerce Building, St. Louis, Mo.

The Hilo Railroad, organized to build railroads on the island of Hawaii, has just ordered one 16 ton saddle tank locomotive with two pairs of driving wheels and a two-wheel trailing truck and one 40 ton 10-wheel engine from the Baldwin Locomotive Works. B. F. Dillingham is President and A. W. Carter Secretary and General Manager of the road, with headquarters at Honolulu, H. I., U. S. A.

The Brooks Locomotive Works have received an order to build two simple six-wheel switching engines for the Western New York & Pennsylvania. They will weigh 125,000 lbs. and have 20-in. x 24-in. cylinders; 51-in. driving wheels; Player Belpaire boilers, with 225 charcoal iron tubes, 2 in. in diam. and 11 ft. 1¼ in. long; 180 lbs. working steam pressure; steel fireboxes, 96 in. long and 42 in. wide; tank capacity, 3,500 gals. of water; Westinghouse brakes, Janney couplers; Monitor injectors and Hancock inspirators; Coale muffled safety valves, Leach sanding devices, French springs, Midvale tires and main wheel centers of cast steel.

The Buffalo & Susquehanna has placed an order with the Brooks Locomotive Works for one simple consolidation engine with B. L. W. improved piston valves. The principal dimensions are: Cylinders, 20 in. x 30 in.; driving wheels, 55 in. in diam.; boilers, Belpaire, with 324 charcoal iron tubes, 2 in. in diam. and 13 ft. 2¼ in. long; working steam pressure, 200 lbs.; fireboxes, steel, 120 in. long and 42 in. wide; tank capacity for water, 5,000 gals. The engines will be equipped with Westinghouse brakes, Pooley couplers, Hancock locomotive inspirators, Crosby muffled safety valves, Leach sanding devices and French springs.

The Rio Grande & Eagle Pass has ordered from the Brooks Locomotive Works one simple consolidation freight engine for September delivery. It will weigh 128,500 lbs., of which 115,300 lbs. will be on the driving wheels, and have 18-in. x 26-in. cylinders; 50-in. driving wheels; wagon top type boiler, with 232 charcoal iron tubes 2 in. in diam. and 13 ft. 10 in. long; 180 lbs. working steam pressure; fireboxes, steel, 108 in. long and 33 in. wide, and a tank capacity for 4,000 gals. of water. The specifications call for Westinghouse brakes, hammered iron axles, metal brake beams, Leeds reversible pilot and Tower automatic tender couplers, Korting injectors, Jerome piston and valve rod packings, Crosby muffled safety valves, Leach double sanding devices, Midvale tires, cast steel wheel centers and Le Chatelier water valves.

#### CAR BUILDING.

The Grand Trunk is asking prices on 500 box cars.

Pullman's Palace Car Co. is building 10 cars for its own general service.

The Colorado & Southern contemplates buying four cafe cars and 100 coal cars of 80,000 lbs. capacity.

It is reported that the Southern is considering buying 500 box cars. We have no official information.

We are reliably informed that the Georgia Southern & Florida is building 300 freight cars at Macon.

The Hinton, New River & Western will buy some rolling stock. (See Locomotive Building column.)

It is reported that the Canadian Pacific is building six cars for passenger service at its Montreal shops.

It is stated that the Interoceanic of Mexico has ordered from the St. Charles Car Co. 125 freight cars.

It is reported that the Ohio Southern will have 500 cars rebuilt at the works of the Lima Locomotive & Machine Co.

The Lehigh Valley wants 500 box cars, but we understand the matter of ordering has been temporarily postponed.

The Butte, Anaconda & Pacific has ordered 100 steel cars of 100,000 lbs. capacity from the Pressed Steel Car Co.

The Missouri, Kansas & Texas has ordered from the American Car & Foundry Co. five chair cars and five passenger coaches.

The Canadian Pacific will build at once, at its own shops, 100 box cars of 60,000 lbs. capacity. Several hundred more will probably be built when this order has been filled.

We are officially informed that the Illinois Central is preparing specifications for sample freight cars, but has not decided as to the number and kinds of cars to be ordered.

The Missouri Midland, now building, will in August probably ask for bids for building one combination baggage and smoking car and one passenger coach. (See Locomotive Building column.)

We are officially informed that the Buffalo, Rochester & Pittsburgh has ordered from the American Car & Foundry Co. 250 80-000lb. double hopper bottom coal cars and 250 plain drop bottom 65,000-lb. cars. These cars will be built either at the works of the Buffalo Car Mfg. Co. or the Jackson & Woodin Mfg. Co., but the details of the dimensions and equipment have not yet been decided.

The Toledo & Ohio Central on April 29 ordered from the American Car & Foundry Co. 350 gondola and 50 side dump cars, for August delivery. They will all be of 60,000 lbs. capacity, 36 ft. 10 in. long over framing, 9 ft. wide, with bodies 3 ft. 3¼ in. high, and equipped with Schoen body and truck bolsters, Monarch brake beams, Westinghouse air brakes, Fulton brasses, Tower couplers, American continuous draft rigging and McCord journal boxes.

The Cleveland, Cincinnati, Chicago & St. Louis is building at its own shops one combination passenger and baggage car 60 ft. long over end sills, 9 ft. 10¼ in. wide over side sills, to weigh 70,000 lbs. and with a seating capacity for 42 persons. The equipment will include steel axles, iron bolsters,

National hollow brake beams, American Brake Shoe Co.'s brake shoes, Westinghouse air brakes, three-stem Janney-Buhoup couplers and Janney-Buhoup draft rigging, Oakette curtains with Burrows'curtain fixtures, Gold steam heating system, iron journal boxes with Q & C pressed steel journal box lids, Plintsch gas, Hale & Kilburn seats, Detroit springs, standard four-wheel trucks with 36-in. steel tired wheels and a wide vestibule on the passenger end.

The Chicago, Indianapolis & Louisville is having 200 box cars and 200 flat cars built by the Haskell & Barker Car Co. for May and June delivery. The box cars are of 60,000 lbs. capacity, 36 ft. long inside, 7 ft. 7 in. high inside and weigh 29,000 lbs. The flat cars are of 80,000 lbs. capacity, 40 ft. long and weigh 27,500 lbs. All the cars will be equipped with steel axles, Christie brake shoes, New York air brakes, Trojan couplers and American continuous draft rigging. Haskell & Barker steel trucks, bolsters and brake beams and malleable iron journal boxes will be used. The roofs, doors and door fastenings of the box cars will also be the standard of the builders. One 60-ft. postal car has also been ordered from the American Car & Foundry Co. to be built at its Jeffersonville, Ind., works. This car will be equipped with Harrison racks, Plintsch gas, Consolidated Car Heating Co.'s steam heating attachments in connection with Baker heater, Trojan couplers, six-wheel trucks, Westinghouse air brakes, blind end vestibules and no platforms.

The Montville (Conn.) Street Railway has ordered eight open and six closed cars from the Newburyport Car Mfg. Co.

The statement published in another railroad paper to the effect that Pullman's Palace Car Co. is building 16 cars for the Metropolitan Elevated of Chicago is denied.

The Mankato (Minn.) Electric Street Railway, Light & Power Co. will, about June 1, ask bids for new rolling stock. Address S. Wilhartz, Manager. (See Electric Railroad Construction column.)

#### BRIDGE BUILDING.

ABERDEEN, S. D.—Bids, according to report, are asked for five steel bridges until May 24. Chas. Eygabroad, County Auditor.

BANGOR, ME.—The Maine Legislature has authorized the city of Bangor to build a drawbridge over Kenduskeag River, near the present European and North American railroad bridge.

BINGHAMTON, N. Y.—Bids will be received until 6 P. M., May 9, for the new Tompkins St. bridge across the Susquehanna River.

BOSTON, MASS.—The New Jersey Steel & Iron Co. will furnish the material for the two highway bridges carrying Massachusetts Ave., Cambridge, and Beacon St., Somerville, over the tracks of the Fitchburg RR.

City Engineer Wm. Jackson will receive bids until May 10 for building bridges on Summer St. extension from A St. and C St., in accordance with plans and specifications and form of contract to be seen at his office.

CHARLOTTETOWN, P. E. I.—The Prince Edward Island Ry. will build a bridge over the Hillsboro River.

CHICAGO, ILL.—The City Council, April 24, authorized the removal of the Taylor St. center pier bridge to Throop St. and made an appropriation for that purpose. The bridge had to be removed from Taylor St. to make room for the new bascule bridge at that point. The United States Engineer would not permit it to be erected at 100th St.

The new Western Ave. bridge over the Chicago Drainage Canal was opened to traffic April 29. It is 320 ft. long and is a steel truss bridge, with two roadways, one for light vehicles and one for traffic teams. The driveways are 25ft. wide, and on each side is a 6-ft. walk for pedestrians. There is a center pier 44 ft. 6 in. in diameter. The bridge was built by the Milwaukee Bridge Co. and cost \$88,000.

COLCHESTER, N. S.—The Midland Ry. of Nova Scotia has let a contract for substructure to the Engineering Contract Co., of New York, for the bridge across the Shubenacadie River. The Dominion Bridge Co. will build the superstructure.

COLTON, WASH.—The County Auditor will receive bids for the main span (60 ft.) of the county bridge to be built across the Union Flat, at Colton.

DUBLIN, TEX.—The Texas Central RR. has contracted with the Edge Moor Bridge Works, of Wilmington, Del., for the construction of four plate girder bridges of various lengths, for different crossings of Cottonwood Creek, near Dublin, Tex.; one 53-ft. plate girder, crossing Sandy Creek, west of Cisco, and one 125-ft. pin-connected span bridge over Battle Creek, west of Cisco. All the above to replace wooden structures. The same company also has a contract for building one 110-ft. span and one 200-ft. span bridges crossing Hubbard Creek and the Clear Fork of the Brazos, respectively, on the extension, which is now being located west of Albany.

EASTON, PA.—A resolution has been introduced in the Common Council to have the City Engineer prepare plans and estimates for a new bridge across the Lehigh River.

FORMAN, N. D.—Separate bids are asked until May 17 for three combination bridges. W. S. Baker, Auditor, Sargent County.

FORT BRAGG, CAL.—Supervisor Flanagan has prepared plans, specifications, etc., for a new bridge across the Big River.

GRAND RAPIDS, MICH.—A new steel bridge, estimated to cost \$14,000, according to report, will be built across the Grand River above North Park.

INDIANAPOLIS, IND.—The County Commissioners are advertising for bridges over Crooked Creek, on the Cline gravel road, 60 ft.; over Grassy Creek, on the Brookville road, 75 ft., and over Bean Creek, on Churchman pike, 36 ft.

KENNEBUNKPORT, ME.—The Cape Porpoise Land Co. has been granted permission to build a toll bridge for foot and carriage travel across tide waters between the mainland at Cape Porpoise and Trots Island, and between Trots Island and Stage Island, in the town of Kennebunkport.



LENAPE, KAN.—An iron bridge, according to report, will be built near Lenape. J. Bleakley, County Auditor, Leavenworth, may be addressed.

LONDON, O.—Bids are wanted May 11 for two iron bridges. W. D. Wilson, Auditor, Madison County.

MARIETTA, O.—Application will be made to the Secretary of War for permission to build a bridge across the Muskingum River, for which plans are now on file in the office of Carl Becker, City Clerk. It was decided at the recent election to issue bonds to the extent of \$70,000 for this work.

MEXICO, ME.—The Berlin Iron Bridge Co. has the contract at \$1,500 for building the bridge over Swift River, which is to replace an old wooden structure.

MODESTO, CAL.—The County Board of Supervisors of Stanislaus County has appointed a committee in reference to building the county bridge at Hills Ferry, for which surveys have been made.

NEWARK, N. J.—The Essex County Board of Freeholders has reached an agreement by which the grade crossing of the Erie RR. on Bloomfield Ave., Verona, will be abolished. The steam railroad tracks will be depressed and spanned by a bridge. The county will bear one-third of the expense, the Erie RR. one-third, and the North Jersey St. Ry. Co. the remaining third. (April 29, 1898, p. 315.)

OBION, TENN.—The Obion & Tiptonville Rapid Transit Co. will need a small bridge on the proposed road. (See Electric Railroad Construction column.)

PEMBROKE, ONT.—Reports state that tenders will soon be asked by the Town Council for building the Mary St. bridge.

PENNEWAWA, WASH.—The Northern Pacific Ry., according to report, will build a new bridge at this place.

PITTSBURGH, PA.—Bills in the Council appropriate \$900,000 for new bridges, including \$110,000 for the Point bridge, \$380,000 for the Tenth St. bridge, \$165,000 for Lincoln Ave. bridge, \$165,000 for Haight's Run bridge and \$80,000 for the Wilmet St. bridge. These are the bridges which Director of Public Works E. M. Bigelow recommended in his annual report and quoted in this column Jan. 6, p. 13.

RALEIGH, N. C.—The Virginia Bridge & Iron Co., of Roanoke, Va., has the contract for the steel bridge at the Falls of Neuse, at \$6,800.

RAMSAY, ONT.—A bridge will be built by the city, according to report, on the boundary line on the eastern side of Glen Isle.

ROCHESTER, N. Y.—The N. Y. C. & H. R. RR. will, according to report, repair the Hill St. bridge.

ST. PAUL, MINN.—The Chicago Great Western Ry. will replace 42 pile and trestle bridges with permanent structures this year.

ST. JOSEPH, MO.—Bids are wanted by May 12 for five new bridges and repairing another. C. W. Campbell, City Engineer.

SHEFFIELD, ALA.—The Southern Ry., according to report, will build a new trestle across the Florence and Sheffield pike, near the city.

TORONTO, ONT.—Tenders will be received until May 22 for building the bridge across the Don River at Queen St., and also for the bridge over the Humber River. C. H. Rust, City Engineer. (April 21, p. 287.)

TROY, N. Y.—Monty, Higley & Co. have the contract for the new steel bridge over the canal at Main St., Sandy Hill, at \$5,600.

WALLA WALLA, WASH.—Sealed proposals will be received until May 20 for a steel girder bridge for the Fourth St. crossing of Mill Creek, in Walla Walla, the successful bidder to remove present wooden bridge. R. P. Reynolds, City Clerk.

WASHINGTON, D. C.—Proposals for building a bridge across the Piney Branch, in Rock Creek Park, will be received by the Commissioners of the District of Columbia until Saturday, May 27. John B. Wight, Commissioner.

WILLIAMSPORT, PA.—The County Engineers will receive bids until April 9 for building three steel highway bridges, the longest being 80 ft. Bids will also be received at the same time for removing old structures. T. R. Winder, County Clerk, Williamsport.

YORK, PA.—The Grand Jury has recommended a bridge built by York County over the east branch of the Cordon Creek, on the line of York and Springfield townships.

#### MEETINGS AND ANNOUNCEMENTS.

##### Dividends.

Pennsylvania.—Semi-annual, 2½ per cent.  
Rome, Watertown & Ogdensburg.—One and one-quarter per cent., payable May 15.

Consolidated Traction (Pittsburgh).—Annual, preferred, 3 per cent., payable May 9.

Central Traction (Pittsburgh).—Annual 1½ per cent., payable May 8.

Duquesne Traction (Pittsburgh).—Annual 2 per cent., payable May 5.

Pittsburgh Traction.—Three and one-half per cent., payable May 5.

West Chicago St. RR.—Quarterly, 1½ per cent., payable May 15.

##### Technical Meetings.

Meetings and conventions of railroad associations and technical societies will be held as follows:

American Association of General Baggage Agents.—The annual convention will be held at Charlevoix, Mich., Monday, June 19. J. E. Quick, Grand Trunk Ry., Toronto, Can., Secretary.

American Association of General Passenger and Ticket Agents.—The annual convention will be held at Boston, Mass., Oct. 17.

American Railway Master Mechanics' Association.—The thirty-second annual convention will be held at Old Point Comfort, Va., beginning Monday, June 19. John W. Cloud, Secretary, The Rookery, Chicago.

American Society of Civil Engineers.—Meets at the house of the Society, 220 West Fifty-seventh street, New York, on the first and third Wednes-

days in each month, at 8 p. m. The annual convention will be held June 18.

American Society of Railway Superintendents.—The annual convention will be held at Detroit, Mich., beginning Sept. 20. C. A. Hammond, Secretary, Asbury Park, N. J.

American Street Railway Association and Street Railway Accountants' Association of America.—The annual convention is set for Oct. 17, at Chicago, Ill. T. C. Pennington, Secretary, 2,020 State St., Chicago.

Association of American Railway Accounting Officers.—The annual convention will be held at Montreal, Can., June 28. C. G. Phillips, Secretary, Chicago.

Association of Engineers of Virginia.—Holds its formal meetings on the third Wednesday of each month from September to May, inclusive, at 710 Terry Building, Roanoke, at 5 p. m.

Association of Railway Claim Agents.—The tenth annual meeting will be held at Buffalo, N. Y., May 24.

Association of Railway Superintendents of Bridges & Buildings.—The annual convention will be held Oct. 17, in Detroit, Mich. S. F. Patterson, Secretary, Concord, N. H.

Association of Railway Telegraph Superintendents.—The annual convention will be held at Wilmington, N. C., May 17. P. W. Drew, Wisconsin Central Ry., Milwaukee, Wis., Secretary.

Boston Society of Civil Engineers.—Meets at 715 Tremont Temple, Boston, on the third Wednesday in each month at 7.30 p. m.

Canadian Roadmasters' Association.—The annual convention will be held at Toronto, Sept. 20. J. Drinkwater, Secretary, Winchester, Ont.

Canadian Society of Civil Engineers.—Meets at its rooms, 112 Mansfield street, Montreal, P. Q., every alternate Thursday at 8 p. m.

Central Railway Club.—Meets at the Hotel Iroquois, Buffalo, N. Y., on the second Friday of January, March, May, September and November, at 2 p. m.

Chicago Electrical Association.—Meets at Room 1737, Monadnock Building, Chicago, on the first and third Fridays of each month at 8 p. m. J. R. Cravath, Secretary.

Civil Engineers' Club of Cleveland.—Meets in the Case Library Building, Cleveland, O., on the second Tuesday in each month at 8 p. m. Semi-monthly meetings are held on the fourth Tuesday of each month.

Civil Engineers' Society of St. Paul.—Meets on the first Monday of each month except June, July, August and September.

Denver Society of Civil Engineers.—Meets at 3 Jacobson Block, Denver, Col., on the second Tuesday of each month, except during July and August.

Eastern Maintenance of Way Association.—The annual convention will be held Aug. 16 at Portland, Me. F. C. Stowell, Ware, Mass., Secretary.

Engineers' Club of Cincinnati.—Meets at the rooms of the Literary Club, 25 East Eighth street, on the third Tuesday of each month, excepting July and August, at 6.30 p. m.

Engineers' Club of Columbus, (O.).—Meets at 12½ North High street on the first and third Saturdays from September to June.

Engineers' Club of Minneapolis.—Meets in the Public Library Building, Minneapolis, Minn., on the first Thursday in each month.

Engineers' Club of Philadelphia.—Meets at the house of the Club, 1122 Girard street, Philadelphia, on the first and third Saturdays of each month, at 8 p. m., except during July and August.

Engineers' Club of St. Louis.—Meets in the Missouri Historical Society Building, corner Sixteenth street and Lucas place, St. Louis, on the first and third Wednesdays in each month.

Engineers' Society of Western New York.—Holds regular meetings on the first Monday in each month, except in the months of July and August, at the Buffalo Library Building.

Engineers' Society of Western Pennsylvania.—Meets at 410 Penn avenue, Pittsburgh, Pa., on the third Tuesday in each month at 7.30 p. m.

International Association of Car Accountants.—The annual convention will be held at Saratoga, N. Y., June 20. G. S. Russell, Secretary, Cedar Rapids, Ia.

Locomotive Foremen's Club.—Meets every second Tuesday in the club room of the Correspondence School of Locomotive Engineers and Firemen, 335 Dearborn street, Chicago.

Master Car & Locomotive Painters' Association.—The annual convention will be held Sept. 12 at Philadelphia, Pa. Robert McKeon, Secretary, Kent, O.

Master Car Builders' Association.—The thirty-third annual convention will be held commencing June 14, at Old Point Comfort, Va. John W. Cloud, Secretary, 774 The Rookery, Chicago.

Montana Society of Civil Engineers.—Meets at Helena, Mont., on the third Saturday in each month at 7.30 p. m.

National Association of Car Service Managers.—The annual meeting will be held June 19 at Niagara Falls, N. Y.

National Association of Local Freight Agents' Association.—The annual convention will be held at Norfolk, Va., June 13.

New England Railroad Club.—Meets at Pierce Hall, Copley Square, Boston, Mass., on the second Tuesday of each month.

New York Railroad Club.—Meets at 12 West Thirty-first street, New York City, on the third Thursday in each month at 8 p. m., excepting June, July and August.

Northwest Railway Club.—Meets on the first Tuesday after the second Monday in each month at 8 p. m., the place of meeting alternating between the West Hotel, Minneapolis, and the Ryan Hotel, St. Paul.

Northwestern Track and Bridge Association.—Meets at the St. Paul Union Station on the Friday following the second Wednesday of March, June, September and December, at 2.30 p. m.

Roadmasters' Association of America.—The annual convention will be held in Detroit, Mich., Sept. 12. J. B. Dickson, Secretary, Sterling, Ill.

St. Louis Railway Club.—Holds its regular meeting on the second Friday of each month at 3 p. m.

Southern and Southwestern Railway Club.—Meets at the Kimball House, Atlanta, Ga., on the second Thursday in January, April, August and November.

Technical Society of the Pacific Coast.—Meets at its rooms, in the Academy of Sciences Building, 819 Market street, San Francisco, Cal., on the first Friday in each month, at 8 p. m.

Texas Railway Club.—We are requested to say that the spring meeting of this club will be held at

Houston, Tex., April 17 and 18, instead of at Bryan, as was recently announced by circular from the club.

Train Dispatchers' Association of America.—The annual convention will be held at Milwaukee, Wis., June 20. John F. Mackie, Secretary, Chicago.

Traveling Engineers' Association.—The annual convention will be held in Cincinnati, O., Sept. 12. W. O. Thompson, Secretary, Elkhart, Ind.

Western Foundrymen's Association.—Meets in the Great Northern Hotel, Chicago, on the third Wednesday of each month. A. Sorge, Jr., 1533 Marquette Building, Chicago, is Secretary.

##### Freight Claim Association.

The annual convention was held on Wednesday of this week at Mobile, Ala.

##### Railroad Commissioners Convention.

The National Convention of Railroad Commissioners will be held at Denver, Colo., Aug. 10.

##### Claim Agents' Association.

The tenth annual meeting of the Association of Railway Claim Agents will be held at Hotel Iroquois, Buffalo, N. Y., May 24. Dr. W. J. Herdman, of Ann Arbor, Mich., will address the Association on "Expert Medical Testimony from a Physician's Standpoint." The President of this Association is C. R. Myers (C. C. & St. L.) of Indianapolis, and the Secretary is Frank E. Thomas of Omaha.

##### Independent Conductors.

The annual convention of the Independent Order of Railway Conductors was held at Montreal, April 26. The officers elected for the ensuing year are: President, F. A. Hermance, New Haven, Conn.; Vice-President, Victor Pigeon, Longueuil, Quebec; Secretary, E. B. Kenyon, New Haven, Conn.; Chaplain, Thomas F. Cook, Springfield, Mass. The next convention will be held at Boston.

##### The American Institute of Electrical Engineers.

The 134th meeting of the Institute held at 12 West 31st street, New York, April 26, was devoted to a topical discussion on "The Limitation of Power Subdivision by Electric Motors in Manufacturing Establishments." Mr. Gano S. Dunn, of the Crocker-Wheeler Co., opened the discussion which was participated in by Messrs. R. T. Lozier, H. B. Coho, H. Ward Leonard, Arthur Williams, Jesse M. Smith, Oberlin Smith, Douglass Burnett, Geo. Hill and F. M. Pedersen.

##### American Institute of Mining Engineers.

The Secretary's office is removed to the fourth floor of the new Phelps-Dodge Building, 99 John Street (corner of Cliff) New York. The Institute has accepted an invitation from the California Miners' Association and from the members resident in California, to hold the autumn meeting on the Pacific Coast. The date has not yet been definitely determined, but will probably be fixed for some time in October. Sessions will be held in San Francisco, and an extended excursion made to the "Mother Lode," with possibly a visit to the Yosemite or to the Grand Cañon of the Colorado, and a stop made at the "Copper Queen" Mine, at Bisbee, Ariz., on the way out or back.

##### The Engineers Club of Philadelphia.

A meeting of the Club will be held on Saturday, May 6, 1899, at 8 o'clock p. m. The Special Committee will present a memorial of the late James McCann. The paper will be "Modern Mine Haulage Practice," (illustrated), by Harry K. Myers.

At the meeting of April 15, Prof. Oscar C. S. Carter (non-member) delivered an address upon "Coastal Topography," in which he described the topographical characteristics of the different portions of the coast of the United States and Alaska. His remarks were illustrated by a series of maps and photographic views projected by the electric lantern. The subject was discussed by Messrs. G. C. Davis, Joseph T. Richards, Charles Hewitt and E. F. Smith, and a vote of thanks was extended to Prof. Carter.

##### American Society of Civil Engineers.

At the meeting of May 3 a paper was presented by Mr. John W. Hill, M. Am. Soc. C. E., entitled "Comparative Tests of Bituminous Steam Coals." At the meeting of May 17 a paper will be presented by Mr. W. W. Curtis, M. Am. Soc. C. E., on "The Artificial Preservation of Railroad Ties by the Use of Zinc Chloride." At the meeting of June 7 a paper will be presented by Mr. George W. Rafter, M. Am. Soc. C. E., on "The Theory of Concrete." All of these papers appear in the April issue of the Proceedings of the Society.

At the meeting of the Board of Direction April 4 the announcement was made that the late Herbert Steward, Asso. Am. Soc. C. E., had bequeathed to the Society \$2,000, to be known as the Herbert Steward library fund. His will also provided that the Society should receive from his library such technical books as may be selected for its library. The Secretary reported that several publishers of technical books have agreed to promptly give their publications to the library. In future, notices of such gifts will be published in the "Proceedings" under the heading of "New Books of the Month."

At a meeting of Juniors held April 12 the subject for discussion was "The Duties and Responsibilities of an Engineer Inspector." At that meeting a resolution was passed looking toward similar meetings in the future, and the Board of Direction was requested to authorize the holdings of such meetings on the second Wednesdays of May and June.

##### Texas Railway Club.

The fourth semi-annual meeting was held in Houston, at the Lawlor Hotel, April 17.

The meeting was called to order at 9 a. m. by President A. S. Grant, Master Mechanic of the Houston East & West Texas; Secretary T. H. Osborne, of the Cotton Belt. The President announced that through the courtesy of the Houston & Texas Central and the Pullman companies, a special train would be provided Tuesday morning to transport the members of the club and their friends to College Station, where the Agricultural and Mechanical College would be inspected and there would be a banquet and a ball.

The resolution was adopted that the regular meeting of this club shall be on the third Monday of April and August at 10 a. m. A resolution to change the date of the spring meeting from the third Monday in April to the third Monday in February was also adopted.

The first paper read was by H. A. Wablert, of the American Brake Co., on "Safety in Train Brake Appliances." The author being absent, the paper was read by the Secretary. The original paper was read



by Frank Hufsmith, Superintendent of Motive Power and Rolling Stock of the International & Great Northern, at the last meeting. A discussion of the same paper, prepared by Master Mechanic N. L. Smitham, of the Texas Midland, was read.

Mr. John Doyle, Master Car Builder of the Missouri, Kansas & Texas, discussed the paper on "Economy in the Increased Capacity of Cars," which was read by Mr. Smitham at the last meeting.

Mr. Galbraith stated that as a result of the movement of traffic on the tonnage basis, the Cotton Belt would hereafter build cars 40 ft. instead of 34 ft. in length.

A paper on "The Impressions of a Motive Power Man as Gathered on a Trip Abroad," prepared by Mr. R. H. Soule, Western representative of the Baldwin Locomotive Works, was next read.

A paper by Mr. E. S. Marshall, General Sales Agent of the Missouri Car & Foundry Co., on "The Responsibility of a Cast Chilled Car Wheel Maker; Its Uses and Abuses," was read, followed by an interesting paper on "The Merits of Improved Metal Draft Gear" by Mr. J. R. Cade, Master Car Builder of the Southern Pacific.

The President announced that nominations for the presidency were in order and Mr. Grant was re-elected. Mr. R. M. Galbraith was elected Vice-President.

A motion to continue the present Executive Committee for the ensuing year was made and carried. The committeemen are: Messrs. A. S. Grant, Master Mechanic of the Houston, East & West Texas; R. M. Galbraith, General Master Mechanic of the St. Louis Southwestern; J. W. Addis, Superintendent of Motive Power and Rolling Stock of the Texas & Pacific; James McGee, Master Car Builder of the Houston & Texas Central; E. S. Marshall, Manager of the Western Railway Equipment Co.

Mr. P. W. Farrel, of Galveston, placed the Island City in nomination for the next meeting place. The motion was adopted. The fall meeting will be held on the third Monday in August.

The programme for this meeting was announced by Secretary Osborne as follows:

New Papers.—1. "The Necessity of Regulation of Foundation Brakes from Empty to Loaded Cars;" W. C. Squire, of the Atchison, Topeka & Santa Fe, Topeka.

2. "Frictional Resistance on Side Bearing and Outer Plates of Car Trucks;" R. M. Galbraith, Master Mechanic of the International & Great Northern.

3. "Liquid Air;" Ira B. Kegler, of Patterson, Sargeant & Co., St. Louis.

Discussions.—1. "The Responsibility of a Cast Chilled Car Wheel Maker; Its Uses and Abuses;" John F. Dickson, of the Dickinson Car Wheel Company, and James Collinson, Superintendent of Machinery of the Gulf, Colorado & Santa Fe.

4. "Relative Merits of Improved Metal Draft Gear;" John Scrogin, Master Mechanic of the Cotton Belt, and P. W. Farrel, General Foreman of the Car Department of the Gulf, Colorado & Santa Fe.

#### PERSONAL

(For other personal mention see Elections and Appointments.)

—Mr. S. J. Cassetty, who was Assistant General Freight and Passenger Agent of the Peoria, Decatur & Evansville until Jan. 1, when he resigned that position, was found dead in Forest Park, St. Louis, on April 25. He is supposed to have committed suicide. He had been ill for a number of years.



The Chief Engineer of the Erie Railroad.

Mr. Burchholz in the dress of his ancestors; a costume worn at the Twelfth Night celebration of the Century Club, New York.

—Mr. William D. Pence, Assistant Professor of Civil Engineering, University of Illinois, has been appointed Professor of Civil Engineering at Purdue University, Lafayette, Ind., in charge of that department. He will leave the University of Illinois at the end of the present term. Prof. Pence is a graduate of the University of Illinois, class of 1886, and has been one of the instructors there ever since. He succeeds Prof. John Morley at Purdue University.

—We have already noted the fact that Mr. C. A. Seley goes to the Norfolk & Western Ry. to take the place of Mr. Henderson as Mechanical Engineer at Roanoke. Mr. Seley had a varied experience in the shop and draughting room and in engineering practice for 13 years and then took service as chief

draughtsman with the St. Paul & Duluth, where he designed and superintended the construction of the new Gladstone shops of that company in 1886. Thence he went to the Great Northern as chief draughtsman, his duties including those ordinarily assigned to a mechanical engineer. He was with that company four years and resigned the position to go into the service of Messrs. Robinson & Cary, dealers in general machinery and railroad supplies in St. Paul, as Mechanical Engineer. He returned to railroad service in 1895 as Mechanical Engineer on the Chicago Great Western. That position he resigned to accept the one that he has now taken.

—We have lately recorded the appointment of Mr. James Osborne as General Superintendent of the Western Division of the Canadian Pacific, with headquarters at Winnipeg. Mr. Osborne entered the mechanical department of the Grand Trunk in October, 1875. He remained there nearly nine years in the offices of the Mechanical Engineer and of the Works Manager. In July, 1883, he went to the Canadian Pacific as Chief Clerk to the Mechanical Superintendent. Three years later he was appointed Chief Clerk to the Vice-President, then he became Car Accountant of the Canadian Pacific, and later Superintendent of Car Service. Still later, the fuel department was added to his duties, and in April, 1896, he was appointed Assistant to the Vice-President, which position he held until he was appointed General Superintendent of the Western Division. This division extends from Ft. William, Lake Superior, to the summit of the Rocky Mountains and to Kootenay Landing, including the Crow's Nest Pass Line. Mr. Osborne has done valuable work in the Car Accountants' Association aside from the work in the strict line of his duties. In this latter Association he has been Chairman of the Demurrage Committee and the Per Diem Committee, and Vice-President and President of the Association.

—Capt. Alfred Ephraim Hunt died suddenly Wednesday, April 26, 1899, at the Hotel Lafayette, Philadelphia, Pa., the immediate cause of his death being an intestinal hemorrhage. It was a great surprise and shock to his friends, as comparatively few of them were even aware of his illness. He had been suffering severely since his return from Porto Rico, but it was not thought that his illness was serious. His death is directly attributable to his military service. In May, 1874, he enlisted in the Ninth Massachusetts, and the following year was made captain. In November, 1876, having removed to New Hampshire, he was appointed first sergeant in the Second New Hampshire Guard and rose to a captaincy a few months later. For nearly fifteen years he was a member of Battery B, National Guard of Pennsylvania, having been one of the first to enroll his name as a private when the battery was organized, on May 17, 1884. Five days later he was elected captain of the battery, which command he held continuously up to last January, when, on the reorganization of the battery, he resigned. He went to Porto Rico in command of his battery. In Porto Rico he contracted malaria, which affected his heart and caused the train of troubles from which he died.

Capt. Hunt was graduated from the Massachusetts Institute of Technology in 1876. For a short time he was with the United States Geological Survey. Later he was connected with the Bay State Iron Works, in South Boston, where the second open-hearth steel furnace in America was built. While with this company he was sent to Michigan to prospect for iron ore, and his report was among the first made on the famous Michigan mines. From 1877 to 1879 he was manager and chemist of the Nashua (N. H.) open-hearth steel works. He went to Pittsburgh in 1879 as Superintendent and chemist of Park Bros. & Co., Ltd. In 1882 he resigned this position and joined with Mr. George H. Clapp, also of Park Bros. & Co., Ltd, to form the firm of Hunt & Clapp, establishing the Pittsburgh Testing Laboratory.

In 1888 he organized the Pittsburgh Reduction Company, to make aluminum by the Hall process. The Pittsburgh Reduction Company was one of the first to profit by the great water power development at Niagara Falls for the generation of electricity. The New Kensington (Pa.) works of this company have recently been greatly increased, and together with the Niagara Falls plant form a large and complete reduction works and manufacturing establishment, including a rolling mill and wire drawing mill. Much of the success of this company has been directly due to the energy, skill and wise judgment of Capt. Hunt, who was its president and general manager.

Capt. Hunt was a member of the American Society of Civil Engineers, the American Society of Mechanical Engineers, the American Institute of Mining Engineers, the American Society for the Advancement of Science, the American Chemical Society, the Institution of Civil Engineers of Great Britain, the Iron and Steel Institute of Great Britain, the Engineers' Society of Western Pennsylvania, etc., and was a prominent Mason.

The Norman gold medal was awarded to him by the American Society of Civil Engineers for his paper, read at the World's Fair Engineering Congress, at Chicago, in 1893, entitled, "A Proposed Method of Testing Structural Steel."

Besides gaining an eminent position in the professional and business world, from which he will be greatly missed, Capt. Hunt had won, by his generosity and kindly consideration for others, the sincere and affectionate regard of his many friends and associates.

#### ELECTIONS AND APPOINTMENTS.

Baltimore & Ohio.—There are to be hereafter but four Division Engineers Maintenance of Way east of the Ohio River, as follows: B. T. Fendall, to have jurisdiction of all lines between Philadelphia and Brunswick, Md., with headquarters at Baltimore, Md.; G. B. Owen, to have jurisdiction of the main line and branches between Brunswick, Md., and Grafton, W. Va., including Brunswick yard, with headquarters at Cumberland, Md.; J. F. Cassell, to have jurisdiction of the main line from Parkersburg to Wheeling, including both terminals and the Belington branch, with headquarters at Grafton, W. Va.; C. T. Manning, to have jurisdiction of the main line and branches from Wheeling to Cumberland by way of Pittsburgh, with headquarters at Pittsburgh, Pa. James H. Clark has been appointed Assistant Superintendent of Floating Equipment.

Canadian Pacific.—D. McNicoll of Montreal, heretofore Passenger Traffic Manager, has been elected Vice-President and T. G. Shaughnessy, heretofore Vice-President, has been elected General Manager.

Cedar Rapids, Garner & Northwestern.—A. F. Brownell has been appointed Auditor and Traffic Manager, with headquarters at Garner, Ia., succeeding R. L. Whittam.

Chattanooga Southern.—The following have been elected officers of this company: President, Henry L. Lamb, Lansingburg, N. Y.; Vice-President, Thos. H. Hubbard, New York, and Secretary and Treasurer, E. C. Osborn, New York.

Chicago, Burlington & Northern.—Jno. R. Hastings, General Superintendent, with headquarters at St. Paul, Minn., has resigned.

Cincinnati, Hamilton & Dayton.—General Manager C. G. Waldo informs us that there is no truth whatsoever in the report that I. F. White, Superintendent of Track and Structures, has resigned.

Columbia Southern.—E. B. DeYoe has been appointed Auditor, with headquarters at Wasco, Ore., succeeding W. S. Lytle, resigned.

Delaware, Lackawanna & Western.—Frederick H. Gibbens, Treasurer, with headquarters at New York, has resigned.

Duluth, Missabe & Northern.—H. L. Dresser has been appointed Chief Engineer, with headquarters at Duluth, Minn., succeeding C. H. Martz, resigned.

El Paso & Northeastern.—E. M. Harter has been appointed Auditor, with headquarters at El Paso, Tex.

Erie.—The headquarters of F. B. Lincoln, Superintendent of the Toga Division, have been removed from Elmira, N. Y., to Arnot, Pa.

Florida Central & Peninsular.—At a meeting of this company, now a part of the Seaboard Air Line, held in New York April 26, the new Directors were elected as follows: John Skelton Williams, James H. Dooley, of Richmond; J. William Middendorf, William A. Marburg, Baltimore, Md., and Mr. Johnstone. The following Directors were re-elected: H. R. Duval, W. Bayard Cutting, R. Fulton Cutting, M. Bayard Brown, New York, and Wayne MacVeagh, of Philadelphia, Pa.

Grand Central Station.—L. Griffith, heretofore in the Engineering Department of the New York Division of the Pennsylvania RR., has been appointed Supervisor, with headquarters at New York, succeeding Frank S. Curtis, resigned.

Grand Trunk.—L. J. Ferritor, heretofore Assistant Superintendent, with headquarters at London, Ont., has been appointed Superintendent, with headquarters at St. Thomas, Ont., succeeding G. C. Jones, transferred.

Great Northern.—E. A. Donkin has been appointed Assistant Superintendent of the Cascade Division, with headquarters at Everett, Wash., succeeding F. J. Hawn, transferred. Effective May 1.

Hilo.—The officers of this Hawaiian road referred to in the Construction column, are: President, B. F. Dillingham; Vice-President, L. A. Thurston; Treasurer, M. P. Robinson; Secretary and General Manager, A. W. Carter; Auditor, H. Waterhouse. The central office is Honolulu, H. I.

Houston, East & West Texas.—W. H. Taylor has been appointed General Freight and Passenger Agent, with headquarters at Houston, Tex., succeeding R. D. Yoakum, resigned. Effective May 1.

Illinois Central.—J. W. Higgins has been appointed Superintendent of Transportation of the Yazoo & Mississippi Valley, with headquarters at Chicago, Ill., succeeding J. M. Daly, resigned. Effective May 1.

Lake Shore & Michigan Southern.—A. L. Kendall has been appointed Master Car Builder, with headquarters at Englewood, Ill., succeeding Thos. Fildes, resigned.

Louisville & Nashville.—E. K. Walker has been appointed General Manager.

Mexican National.—William Burckel has been elected Secretary, succeeding Andrew Anderson, Jr., of New York, resigned.

Minneapolis & St. Louis.—Frank Nay has been appointed Auditor, with headquarters at Minneapolis, Minn., succeeding O. C. Post, resigned.

Minnesota Transfer.—Jno. R. Hastings, President, has resigned.

New Orleans & Northwestern.—F. W. Main has been elected Treasurer, with headquarters at Natchez, Miss.

New York Central & Hudson River.—The absorption of the West Shore into the N. Y. C. & H. R., has brought about the following division changes, effective May 1: The jurisdiction of J. P. Bradfield, Superintendent of the Western Division of the N. Y. C. & H. R., is extended over the West Shore from Buffalo to Syracuse, including Syracuse and the Chenango branch. The jurisdiction of F. A. Harrington, Superintendent of the Mohawk Division of the N. Y. C. & H. R., is to include the West Shore from Syracuse to Ravena, but not to include either point. These two portions are to be included in the Western and Mohawk divisions, respectively, and are to be known under those division names. J. B. Stewart is Superintendent of the West Shore Division, which extends from Ravena to Weehawken. Frank S. Curtis, heretofore Supervisor of the Grand Central Station, New York City, has been appointed Engineer of the West Shore Division, with office at Kingston, N. Y.

The Fall Brook and its leased lines, taken over May 1, are, with the Beech Creek road, already controlled by the New York Central, to constitute the Pennsylvania Division of the Central. A. G. Palmer, heretofore Superintendent of the Beech Creek becomes Superintendent of the new division, 412 miles in all, and will have his office at Corning, N. Y. L. J. Carmalt, heretofore on the Hudson Division, is appointed Division Engineer of the Pennsylvania Division.

Northern Alabama.—At a meeting of the stockholders, held April 29, the following officers were elected: President, Samuel Spencer; First Vice-President, A. B. Andrews, Raleigh, N. C.; Second



Vice-President, W. W. Finley, Washington, D. C.; Third Vice-President and General Manager, P. S. Gannon, Washington, D. C.; Secretary, Josiah F. Hill, New York, and Treasurer, H. C. Ansley, Washington, D. C.

Ohio Southern.—C. D. Whitney, with headquarters at Springfield, O., is to assume the duties of Traffic Manager, in addition to those of Auditor. F. E. Fisher, General Passenger and Freight Agent, with headquarters at Lima, O., has resigned.

Pittsburgh, Bessemer & Lake Erie.—R. A. Franks has been elected Treasurer, succeeding T. H. Given, resigned.

Rice Lake, Dallas & Menomonic.—Stuart J. Fuller has been appointed Auditor, with headquarters at Rice Lake, Wis.

Rock Island & Peoria.—A. McCormick has been appointed Master Mechanic, with headquarters at Peoria, Ill., succeeding Joseph Elder, resigned.

St. Louis, Indianapolis & Eastern (successor to the Indiana & Illinois Southern).—W. G. Bruen has been elected Secretary, with headquarters at Chicago, Ill., succeeding H. H. Gardner. C. P. Walker has been appointed Trainmaster.

Santa Fe Pacific.—W. J. Wilcox has been appointed Division Master Mechanic, with headquarters at Winslow, Ariz., succeeding T. F. Underwood, resigned.

South Carolina & Georgia.—Edwin Parsons has been elected Vice-President, with headquarters at New York, succeeding Charles Parsons, Jr., deceased.

Southern Pacific.—At a meeting of the stockholders the following new Directors were elected: F. S. Douty, C. E. Green and George Crocker.

Vera Cruz & Pacific.—W. W. Penney, Chief Engineer, having resigned, the duties of that office will be assumed by General Superintendent Sheldon T. Bent. Ernest A. Bell has been appointed Assistant Treasurer.

Virginia & Southwestern (successor to the Bristol, Elizabethton & North Carolina).—We are officially informed that Wm. S. Battle, Jr., has been appointed General Superintendent, with headquarters at Bristol, Tenn. Effective May 1.

Wadley & Mt. Vernon.—W. I. Zachry has been appointed Superintendent, with headquarters at Adrian, Ga.

Wheeling & Lake Erie.—The officers of this company, successor to the old company, are: Robert Blickendorfer, President; Alvin Krech, of New York, First Vice-President; James Dowland, Toledo, Secretary and Treasurer; George Turner, New York, Assistant Secretary. Directors—Robert Blickendorfer, Henry J. Booth, John Crosby Brown, E. R. Ade, Willard J. Crawford, James H. Dowland, Daniel H. Hanna, W. H. Hastings, Alvin W. Krech, Earl W. Oglesby, Richard M. Parmelee, Charles C. Needham and William Whiting.

#### RAILROAD CONSTRUCTION, New Incorporations, Surveys, Etc.

ARKANSAS NORTHWESTERN.—Henry Dalhoff, of Little Rock, Ark., has the contract for grading 25 miles from Stamps, Ark., northwest to Hope, and work was to be begun May 1. W. I. Foster, of Hope, is President. (April 21, p. 288.)

ARKANSAS ROADS.—E. S. & D. J. McCarthy are reported to be at Pine Bluff, Ark., in the interest of a railroad from that city southeast 25 miles along the line of Bayou Bartholomew toward Starr City. Their proposition is that when the road is built and equipped the citizens will take \$50,000 of first mortgage bonds. They will begin building within 30 days after the bond subscription is completed.

ATLANTA & WESTERN.—This company proposes to build a line from Bristol, Tenn., east about 75 miles to Independence, Va. The people of Grayson County, Va., on May 25 will vote on the proposition of subscribing \$150,000 to the capital stock.

ATLANTA, KNOXVILLE & NORTHERN.—The General Manager writes that there has been some talk of extending the line south to Atlanta, but no action has been taken. It is the intention of the company to run some lines and make estimates of the cost to see if the results would justify the company in taking some definite action. Surveys will probably be begun within a month. (April 21, p. 288.)

BANGOR & AROOSTOOK.—This company expects during the coming year to extend its line from Caribou, Me., north 30 miles through New Sweden and Stockholm into Van Buren. Surveys are in progress. The work is light. The maximum grade is 1½ per cent. There will probably be required five bridges from 30 to 120 ft. long, and two viaducts of about 180 ft. The rails are already purchased. (April 21, p. 288.) The company will probably give out no contracts. (Official.)

BANGOR & PORTLAND.—The Easton & Northern extension from South Easton, Pa., south four miles to connect with the Lehigh Valley, is being built by the Lehigh Valley, which leases the property to the B. & P. The intention was to complete the line by May 1. (April 28, p. 305.)

BLACK DIAMOND.—The Dover, Kentucky & South Atlantic, one of the branches of this proposed system, has filed amended articles of incorporation in Kentucky to increase its capital stock from \$20,000 to \$45,000.

The Black Diamond Mineral & Timber Belt was incorporated April 27, in Kentucky, to build a loop from the main line, encircling 16 coal counties of eastern Kentucky. It will run from Carlisle southeast and then south about 250 miles via Sharpsburg, Owingsville, West Liberty, Salsersville, Crestonburg, Paintville, Pikeville, Whitesburg and Pineville to Jellico Narrows on the main line. Among the incorporators are: Colonel Albert E. Boone, of Zanesville, O., and W. J. Kennedy, Mayor of Carlisle, Ky. (March 24, p. 217.)

CANADA ATLANTIC.—Mayor Johnstone of Parry Sound has made arrangements with the owners of the Booth system of railroads to build the spur line from the Ottawa, Arnprior & Parry Sound to Parry Sound, as part of the James Bay road to be operated by the Canada Atlantic.

CANADIAN PACIFIC.—Superintendent James has returned to Winnipeg, after arranging for track laying on the Pipestone extension. There are 125 men at work and they have about one mile completed. As soon as the 20 miles already graded is laid with rails, men will proceed to extend the grade.

Work is being pushed on the Columbian & Western line from Robson, B. C., to Midway, 105 miles. Right of way is cut out from Eholt Summit to Boundary Falls, and grading is well advanced to Midway. It is said the line will be completed to Midway this summer. The company proposes to bond the projected road at \$35,000 a mile. (April 7, p. 252.)

The company is double tracking from Vaudreuil to Montreal, Que.

A party of engineers left Nelson, B. C., a few days ago for Argenta, at the head of Kootenay Lake, to lay out a line from that point. It was intended that the road should first turn from Arrow Head up Fish River and thence to Trout Lake, following along the west side of the lake to the Lardo River to a point near Argenta, but it has been decided, however, to begin work at once at the Argenta end. This will make a shorter line between Nelson and the main line of the C. P. R., the only changes needed being at Revelstoke and Nelson.

H. D. Lumsden, an engineer of the company, left Winnipeg May 1 with his staff, to make estimates for double tracking the line from Winnipeg to Fort William, Ont., which the company proposes to do at once. Tenders are in for the new permanent bridges between Winnipeg and Fort William at Brokenhead, Whittemouth and Tyndall.

Mann, Foley Bros. & Larson have received contracts for about 40 miles of branch lines to mining camps in the Boundary Creek District, B. C. This will put the company in position to handle all the ores of the different camps as soon as the main line is completed. The upper branch will be from Greenwood to the Deadwood and copper camps, from Eholt to Greenwood, Wellington and Central camps, and short branches to Summit and Long Lake camps. (April 21, p. 288.)

CANADIAN NORTHERN.—This company, which was recently incorporated to amalgamate the Lake Manitoba Ry. & Canal, and the Winthrop Great Northern (Feb. 3, p. 92), has begun ballasting the entire line. Work on the Southeastern branch was begun at St. Boniface and is being carried on at many points along the line.

CANADIAN YUKON RAILWAY & TRANSPORTATION.—The contracting firm of MacKenzie & Mann are asking the Canadian Government for the renewal of the charter for this line from a point on the Stikine River in British Columbia, north to Teslin Lake and thence to Dawson City, N. W. T.; also from the Stikine River south to a point in British Columbia capable of being made an ocean port; also a line from the Lynn Canal via Mt. Selkirk to Dawson City. The bill was reported on April 12. It is practically the same bill as the one introduced last year which failed of passage. (Feb. 4, 1898, p. 88.)

CHESAPEAKE & OHIO.—The line is located and grading begun on the extension from Prince, W. Va., southwest up Piney Creek, 13 miles to Beckley. (April 28, p. 305.) C. D. Langhorne of Greenwood, Va., has the contract. The maximum grades are 2½%, and the maximum curves 14°. There will be four bridges, the one across New River being 700 ft., the others much smaller. No new securities will be issued for building the extensions. (Official.)

CHICAGO GREAT WESTERN.—The principal part of the improvements this year (April 7, p. 253) will be the extension of passing tracks, relaying about 90 miles of track with 75-lb. rails, 60 ft. long, ballasting about 200 miles of track, replacing 42 tie and trestle bridges with permanent trusses, replacing 150 wooden culverts with stone or cast-iron pipe, replacing six iron structures aggregating 800 lineal feet and strengthening three structures aggregating 1,280 ft. for new locomotives. (Official.)

CHICAGO, MILWAUKEE & ST. PAUL.—It is authoritatively announced that a survey is to be begun this week for a line from Boone, Ia., north to Fraser and thence along the Des Moines River through the Boone and Webster County coal fields to Lehigh, the southern terminus of the Mason City & Fort Dodge. When completed this will make a direct connection from Des Moines to St. Paul, Minn. (April 14, p. 271.)

COLUMBIA SOUTHERN.—Permanent surveys are to be made at once for the extension from Moro, Ore., south 30 miles to Antelope. As soon as this is completed it is stated that grading will be begun. (April 7, p. 253.)

The company has asked the people of Goldendale, Wash., to give right of way through that city and depot grounds for the proposed Columbia & Klickitat line from Lyle northeast about 20 miles to Goldendale. The condition is that grading be begun not later than July 1 and the road completed before Jan. 1, 1901. E. E. Lytle, of Moro, is President. (C. & K., Dec. 2, 1898, p. 867.)

COLUMBUS, LIMA & MILWAUKEE.—The difficulties over the crossing of the Northern Ohio near Gomer are settled and grading is completed, according to report, for the entire distance from Lima to Defiance, 39.96 miles. The road, when completed, is to run from Columbus, O., via Lima and Defiance to Saugatuck, Mich., 285 miles. J. G. W. Cowles, of Cleveland, is President, and C. T. Hobart, of Defiance, Chief Engineer. (April 7, p. 253.)

DAVENPORT, CLINTON & EASTERN.—This company proposes to build a railroad from Davenport, Ia., northeast to Clinton, and thence across the river. Application has been made to the Common Council at Clinton for right of way over city property for the line. Surveys were made some time ago. Frank P. Blair of Davenport is Vice-President.

DENVER & MONTANA.—This company was incorporated in Colorado April 26, with a capital stock of \$1,000,000, to build the proposed Chicago, Burlington & Quincy line from Alliance, Neb., south about 160 miles to Brush, Colo., near Denver. It was erroneously said two weeks ago that this was to be built under the Nebraska, Wyoming & Western, but that incorporation was for another extension. The articles were filed by H. D. Allee, Auditor of the Burlington. (C. B. & Q., April 21, p. 288.)

DETROIT & NORTHERN.—The Common Council of Marine City, Mich., on April 25 granted a franchise to this company, which proposes to build a line from Mt. Clemens, Mich., northeast through Marine

City to Port Huron. Theodore H. Bacon of Marine City is Chief Engineer. (April 14, p. 271.)

FITCHBURG.—This company is to begin work on the four tracking of its line between Boston, Mass., and West Cambridge, but little more than four miles. Probably two miles will be completed this season. Holbrook, Cabot & Daly, 1142 Tremont Building, Boston, Mass., have the contract for grading and masonry. Two highway bridges carrying over the tracks Massachusetts Ave., Cambridge and Beacon St., Summerville, will be built this year. The New Jersey Steel & Iron Co., will supply the steel work. The companies own forces are lowering and changing the tracks. The principal part of the work to be done consists in building retaining walls and highway bridges through the cut at Cambridge, which is nearly one-half mile long. This work is already begun and considerable masonry is finished. (Official.)

GAINESVILLE & GULF.—This company, whose line now runs from Fort Drane, Fla., north to Gainesville, 27 miles, will extend its line about 20 miles north to Sampson City on the Southern. (See Railroad News column.)

GRAND RAPIDS & INDIANA.—Surveys are reported in progress for a branch from Portland northwest to Camden in the same county, with a possible further extension to Huntington.

GREAT NORTHWEST CENTRAL.—Surveys are being made for an extension eastward 60 miles from Portage la Prairie, Man., to connect with a new road proposed by the C. P. R. from McGregor. (See Railroad News column.)

HAWAII ROADS.—The new railroad, to which reference was recently made in this column (April 7, p. 253), is the Hilo RR. The first section will be about 15 miles long, running from Hilo on the Island of Hawaii south through the Olaa coffee and sugar district to reach a new 10,000-acre sugar plantation. It is also proposed to push the building of the road from Hilo to Mahakona through the Hamakua District, which is often described as 40 miles of sugar cane. This portion of the road will cross many very deep gulches, which will require curves as sharp as 30 deg., and grades of 3 per cent. C. H. Klugel, who has been Chief Engineer of the Oahu Ry. & Land Co., for the past 10 years, will be Chief Engineer. He is now pushing the surveys and preliminary work. The railroad is to be standard gage, laid with 60-lb. steel on Redwood and Ohia (native wood) ties. The officers are given under Elections and Appointments. (Official.)

HINTON, NEW RIVER & WESTERN.—Grading is completed for 3½ miles on this line from Hinton, W. Va., northwest through Mercer salt wells and East River to Narrows New River. It is surveyed southeast along the east side of New River. The entire work is very light, the maximum grade being 25 ft. per mile. There will be three bridges required of 640 ft., 600 and 100 ft., respectively. The track will be laid with 60-lb. rails. James McCreery (March 4, 1898, p. 169), of Hinton, W. Va., is President, and Wm. Ingalls, of Radford, Va., Chief Engineer. (Official.)

LOWELL & HASTINGS.—This company expects to begin building the extension from Lowell, Mich., north 17½ miles via Alton, Slayton and Cooks Corners to Belding in a few days. W. A. Smith & Co., of Grand Rapids, have the contract. (Dec. 16, 1898, p. 904.) The proposed extensions further north from Belding and from Freeport south are not yet determined. (Official.)

MANITOBA & SOUTHEASTERN.—Neil Keith has taken the contract for the completion of this line from the present terminus 46 miles from Winnipeg, southeast to the International boundary line. (Jan. 20, p. 53.)

MILFORD, MATAMORAS & NEW YORK.—Building is to be resumed soon, according to report, on this line from Erie, at Port Jervis, N. Y., to run across the Delaware River to Matamoras. About a mile of track on the Port Jervis end was laid last year. L. Marthemont, of Milford, Pa., is a Director. (Sept. 2, 1898, p. 639.)

MINNEAPOLIS & ST. LOUIS.—The General Manager writes that his company has not considered the reported extension of its line from Britt, Ia., south into Wright County, and does not contemplate any building in that vicinity. (April 21, p. 289.)

This company has completed the survey for the proposed branch from New Ulm, Minn., south to Storm Lake, Ia., connecting the Illinois Central. The connecting points in Iowa are Esterville, Spencer and Sioux Rapids. Right of way is secured along the survey, and it is proposed to rush the construction as rapidly as possible. (March 3, p. 161.)

MISCELLANEOUS COMPANIES.—The Sanford Construction Co. has been incorporated in Maine, with a capital stock of \$10,000, to build railroads. The incorporators are: E. M. Goodall, Louis P. Goodall, George B. Goodall, Chas. A. Bodwell, William J. Bodwell, Fred. J. Allen, all of Sanford, Me.; John Hopewell, Cambridge, Mass.; Frank Hopewell, Newton, Mass.

MISSOURI MIDLAND.—Grading was begun a month ago on this line from Columbia, Boone County, Mo., to Kennard, 8½ miles. Johnston Bros. & Faught, of St. Elmo, Ill., have the general contract, and sub-contracts have been let to Willard Johnston, Stephen Campbell and George Steen. Track is laid for two miles. There are 300 men at work. The three miles at the north end near Columbia are quite difficult, there being considerable rock, in all 250,000 cu. yds. The maximum grade is one per cent., and the maximum curve four degrees. There will be required a steel bridge of 190 ft.; four steel bridges of 75 ft. each, and 1,500 ft. of trestling. The line is to be completed July 1. (April 28, p. 305.) Chas. Wiggins is President and Robert Moore, Chief Engineer, all of St. Louis (Bank & Commerce Building), Mo. (Official.)

MISSOURI PACIFIC.—The company is doing nothing regarding the extension from Little Rock, Ark., west 165 miles to Greenwood (Dec. 16, 1898, p. 904), beyond completing the survey. (Official.)

MONTGOMERY, HAYNEVILLE & CAMDEN.—Grading is completed for 11 miles from Camden toward Allenton, on this line from Montgomery, Ala., southwest 102 miles via Hayneville, Farmersville and Camden to Suggsville, with extensions from Suggsville to Mobile, 72 miles, and to New Orleans, 183



miles. The company is now offering its bonds for sale. (Jan. 20, p. 53.) S. D. Bloch, of Montgomery, Ala., is President.

**MOSCOW, CAMDEN & ST. AUGUSTINE.**—This company will probably resume building in July on this line from Moscow, Tex., northeast 60 miles to St. Augustine. Track was laid last year on the section from Moscow to Camden, seven miles. (Sept. 16, p. 679.) W. T. Carter, of Camden, Tex., is President. (Official.)

**NEW MEXICO ROADS.**—Preliminary surveys are begun, according to report, for a line from Deming, at the junction of the Southern Pacific and the Atchison, Topeka & Santa Fe, to run south 35 miles to Columbus on the Mexican International line. It is said that the work is being pushed by local investors, who expect ultimately to build a road north to Salt Lake City and south to Chihuahua, Mex.

**NEW ORLEANS & NORTHWESTERN.**—This company's line, which extends from Natchez, La., north 102 miles to Bastrop, is to be extended north to Little Rock, Ark., under the charter, it is said, of the recently incorporated Little Rock & Gulf. The N. O. & N. W. is only about 14 miles from the Arkansas line, from which point the L. R. & G. will carry it to Little Rock. (L. R. & G., Feb. 17, p. 131.)

**NORTHERN PACIFIC.**—Right of way is being procured for the extension from Portage la Prairie, Man., northwest to the Thistle District, including a branch toward Lake Manitoba. Messrs. Abbott True, Toronto, and G. R. Turnbull, left Winnipeg April 21 with 150 men to begin operations on the extension. (April 14, p. 222.)

**PANTHER & WYOMING.**—This company has been incorporated in West Virginia to build a railroad in the southern end of the State from Panther Creek, a tributary of Tug River, south to the State line. R. E. Pendleton of McDowell County is an incorporator.

**PENNSYLVANIA COMPANY.**—McNally Bros., of Pittsburgh, are reported to have received the contract for the extension of the New Cumberland branch through Kenilworth, W. Va., east about four miles to Chester. The line may be extended as far as Georgetown. (March 24, p. 217.)

**PENNSYLVANIA ROADS.**—Most of the right of way is reported secured for the line from Ligonier, Pa., on the Ligonier Valley, southeast seven miles via Mechanicsburg to Laurel Hill Mt., and grading is to be begun about June 1. (March 31, p. 236.)

**PONTIAC PACIFIC JUNCTION.**—The company is about to begin building its line from Aylmer, Que., northeast 10 miles to Hull. Surveys are already completed and from 300 to 400 men will be put at work at once. It is expected that the extension will be completed in about four months. (March 17, p. 198.)

**PRINCE EDWARD ISLAND.**—The Canadian Government, which owns this line, is about to ask for tenders for 1,000 tons of rails to complete the road. Attorney General McDonald states that the Government is preparing to enter into an arrangement for building a bridge for railroad and other purposes across the Hillsborough, giving an outlet from Charlottetown to the southern end of the island. (Canadian Roads, Sept. 26, 1898, p. 618.)

**READING, LANCASTER & BALTIMORE.**—D. R. Brewer & Co., of 52 Broadway, New York, are reviving this proposed line which was chartered in October, 1891, in Pennsylvania, to run from Reading south to New Holland, and thence to a point in Maryland, where connection will be made with a line to Perryville, Md., at the head of Chesapeake Bay. This was partially graded in 1892 from Mohnsville south of Reading to Adamstown. At that time H. C. Lehman, of Philadelphia, was President. It is stated that J. P. McDonald & Co., of 33 Wall St., New York, have received the contract for building the road, and that grading will be begun as soon as locating surveys are completed, if not before. It will follow for the most part the old survey, making a line about 70 miles long. (Nov. 6, 1891, p. 791; July 15, 1892, p. 538.)

**SEABOARD AIR LINE.**—Surveys are reported in progress for an extension of three miles from Loganville, Ga., to McElvaney's mill.

**SOUTHERN PACIFIC.**—The entire gap from Surf, Cal., along the ocean to Ellwood, 56 miles, is under contract. McNutrie & Stane have the grading, track laying and masonry, and the Thompson Bridge Co. will build the bridges. Grading is completed and track laid from Surf to Hundon, five miles. (Official.)

**TENNESSEE ROADS.**—The Elk Valley Coal & Iron Co., according to report, will build a railroad three miles long from Elk Valley station, on the Southern Ry., into its mineral and timber lands. It is to be completed by Aug. 1.

**TRANSYLVANIA.**—(See Railroad News column.)

**UTAH EASTERN.**—This company has filed amended articles of incorporation in Utah to build an extension connecting it with the new line of the Rio Grande Western, now building from Provo City, Utah, northeast 15 miles toward Heber City. S. H. Babcock is President, and Theron Geddes, Secretary, both of Salt Lake City, and officials of the Rio Grande Western.

**WHITMIRE, NEWBURY & AUGUSTA.**—At a recent meeting of the incorporators it was decided to open books for subscription for this road, recently chartered in South Carolina with a capital stock of \$150,000, to run from Whitmire on the Seaboard Air Line, south about 75 miles via Newbury, Salda and Edgefield, S. C., to Augusta, Ga. Dr. Jas. McIntosh of Newbury is Chairman of the Board. (Feb. 24, p. 146.)

**WEST VIRGINIA & POCOHONTAS.**—This company has been incorporated in West Virginia, with a capital stock of \$100,000, to build a railroad from Welch south up the south fork of Tug River, to a point at or near its head on the State line. Isaac F. Mann of Newell is an incorporator.

**WEST VIRGINIA RAILWAY & COAL.**—This company has been incorporated in West Virginia, with a capital stock of \$300,000, to operate in Randolph County. Elwood Thorne of New York City is an incorporator.

**WILSON & SUMMERTON.**—Grading was begun last week, according to report, on the proposed extension from Sumter, S. C., north 31 miles to Camden. (March 31, p. 236.)

#### Electric Railroad Construction.

**ALEXANDRIA, VA.**—The Washington, Alexandria & Mt. Vernon Ry. Co., at a recent meeting held in Philadelphia, Pa., decided not to build the extension from Arlington Junction to Fairfax Court-house.

**ANACONDA, MONT.**—An electric railroad will be built from the corner of Maine and Third Sts., easterly about nine miles to Gregson Springs. J. J. Mc-Masters, a former roadmaster of the Butte, Anaconda & Pacific, it is said, will be superintendent of construction of the new line.

**BENNINGTON, VT.**—President Geo. Greene, of the Bennington & Hoosick Valley Electric Ry. Co., is reported as stating that it is the intention of the company to begin work during the summer at either Valley Falls or Lansingburgh, N. Y. He is endeavoring to secure right of way through Schaghticoke, where the power house will probably be built.

**BELFAST, ME.**—Wm. H. Quimby of Belfast informs us that it is not the intention of his company to build the proposed electric railroad this spring, but work will probably be begun early in 1900.

**BLUEHILL, ME.**—The incorporation of the Bluehill & Bucksport Electric RR. was approved March 15. The incorporators are: Merrill P. Hickley, A. M. Devereux, Frank P. Merrill, Frank P. Green, Austin T. Stevens, Nahum Hickley and Rufus P. Grindle. The company is given exclusive right between the places named via Orland and work must actually be begun within two years.

**BOULDER, COLO.**—S. R. Thompson and Robert E. Foote of Denver are reported interested in a project to build an electric railroad in Boulder and vicinity, one line being to Tuxedo Park.

**BROOKLYN, N. Y.**—The Brooklyn Rapid Transit Company's power house at Kent Ave. and Rush St., in the Eastern District on the river front, was damaged by fire to the extent of about \$100,000 on the evening of May 1. This is the power house which supplies the Brooklyn Bridge with electric power, and at no time did the fire interfere with the operation of the dynamo.

**BUFFALO, N. Y.**—The Ridge Road & Lake Shore RR. Co., which was incorporated April 25, and noted in this column last week under West Seneca, proposes to build four miles of electric railroad from West Seneca from the intersection of the Ridge Road at White's Corners, to a point on the Hamburg Turnpike, near Rush Creek. All the incorporators of the company are Buffalo men.

**CHARLEROI, PA.**—Work is progressing on the Charleroi & West Side St. Ry., which is being extended south to California, Pa., and it will probably be opened Aug. 15. (Feb. 10, p. 109.)

**CHICAGO, ILL.**—Work on the double track extension of the Chicago & Milwaukee Electric Ry. from Highland Park to Evanston, is begun at Wilmette. It will be extended north from the connection with the Chicago, Milwaukee & St. Paul at Llewellyn Park. After this work is done the line from Highland Park to Waukegan will be double tracked. Work at enlarging the power house at Highwood is also begun. An auxiliary power house will be erected at North Chicago.

**CLEVELAND, O.**—The Cleveland, Medina & Southern Electric RR., we are informed, has changed hands. The company now in control was promoted by J. David and W. H. Lamprecht, of Lamprecht Bros. Co., local bankers and trustees for the company. Mr. David says that the amount of bonds already subscribed aggregate \$350,000. The company is ready to receive bids for material for general equipment, and for building the road. Address J. David, Century Building, Cleveland, O. In September it was reported that 30 miles of the roadbed had been graded, and all masonry work, including culverts and bridges, had been put in place. Joseph W. Roof was President of the old company. (Sept. 2, 1898, p. 639.)

**COLUMBUS, O.**—The Central Ohio Electric Ry. Construction Co., has been incorporated with a capital stock of \$10,000. The incorporators are Will J. Dusenbury, John J. Dun, George S. Gule, Eugene N. Morgan, F. S. Wagenhals, all of Columbus.

**DALLAS, TEX.**—The Dallas Consolidated Electric St. Ry. Co., which was recently sold to G. von Ginkel of Des Moines, Ia., and others, has received material for transforming the Akard St. and McKinney Ave. mule line into an electric railroad.

**DENVER, COLO.**—The Denver Tramway Co., which is the outcome of the consolidation of the street railroads in Denver, has petitioned the Board of Public Works of that city for permission to change its lines now operated by cable to electricity.

**DEXTER, N. Y.**—The Brownville & Dexter St. Ry. Co. has been granted a franchise to build an electric road between those two villages. The Black River Traction Co. now runs from Watertown to Brownville and the new road will be operated in conjunction with that company. It is expected that cars will be running to Dexter by June 15. J. A. Leberecher is President of the B. & D., Geo. H. Walker, Attorney, and S. R. Smith, Superintendent.

**ELIZABETH, N. J.**—Senator John Kean has accepted the franchise recently granted by the Common Council, and has paid to the county \$250,000, to operate an electric railroad from Elizabeth to Plainfield, a distance of 14 miles. His present horse car system will be converted into an electric road. (April 7, p. 254.)

**ELLSWORTH, ME.**—The time for building the Ellsworth St. Ry., which was incorporated in 1899, has been extended two years.

**ERIE, PA.**—The Erie Transit Co. is said to be forming a new company to be known as the Erie-Northeast Line, and that an organization has been perfected with E. T. Walker of Philadelphia as President; W. E. Hayes of Erie, Vice-President; G. D. Howell, Philadelphia, Secretary, and Isaac Walker, Treasurer.

**FITCHBURG, MASS.**—The Gardner, Westminster & Fitchburg St. Ry. was incorporated April 13.

**GAINESVILLE, GA.**—D. E. Evans, of Gainesville, is said to be forming a company to rebuild the five miles of street lines in this city. An electric plant will be built and electricity will also be supplied for commercial purposes.

**GUTHRIE, OKLA.**—The road, in which D. F. Smith, of Kingfisher, is interested, is in Oklahoma and not Ontario, as incorrectly reported in this column last week.

**HAMBURG, N. Y.**—The Hamburg RR. Co. has filed notice with the Secretary of State to extend its route westerly along the Ridge Road in the town of West Seneca to the tracks of the Western New York & Pennsylvania. Daniel W. Allen, Secretary and Manager.

**HAMILTON, ONT.**—A syndicate is reported to have secured a majority of the stock of the Hamilton St. Ry. Co., in the interest of the Cataract Power Co., which has had in contemplation for some time building electric railroads to reach Galt and Guelph, and also a line to Flamboro. The line to Galt and Guelph will cover a rough piece of country, and the expense of building has so far deterred every one from touching it. John Patterson is Secretary of the Cataract Power Co.

**HARTFORD, CONN.**—It is said that sufficient subscriptions have been made to the stock of the Bloomfield, Tarriffville & East Granby Tramway Co., which was incorporated in the early part of 1897. The capital stock of this company is set at \$100,000 with the privilege of increasing to \$300,000. The proposed route of the electric railroad is from the village of Rainbow, in the town of Windsor, to the Hartford City line, when it will probably connect with the Hartford St. Ry.; also from East Granby southerly to connect with other electric lines at Spoonville bridge. A line is also proposed from Tarriffville northerly by a main highway to Granby St., through North Granby, continuing to the state line. Of the incorporators Hiram R. Mills, of Bloomfield, is Secretary; S. D. Douglass, of Windsor Locks; Geo. D. Curtis and D. F. Keenan, of Hartford, are also interested.

**INDEX, WASH.**—The Sunset Power, Mining & Milling Co. has been granted a 50-year franchise to build an electric railroad from Index over the county road to Galena. Surveys were recently completed.

**INDIANAPOLIS, IND.**—D. P. Erwin, Daniel M. Ransdell, D. M. Parry, H. C. Adams and Geo. C. Webster, who propose to build an electric railroad into Hendricks County by way of Plainfield, have organized the Indianapolis & Plainfield Electric Traction Co., with a capital stock of \$100,000. Application will soon be made for incorporation. It is said that it will be necessary to build only 10 miles of track to Plainfield, as the company will use part of the tracks of the Indianapolis St. Ry. Several franchises have already been secured.

**KANSAS CITY, KAN.**—The charter of the Kansas City Forest Lake & Bonner Springs Ry. has been amended and the name of the company is now the Kansas City, Bonner Springs & Topeka Ry. As the charter now reads, the company has the privilege of running the line through the counties of Leavenworth, Jefferson, Douglas and Shawnee to Topeka, about 75 miles. A part of the right of way has been secured. The Board of Commissioners of Wyandott County has petitioned for the right to run the road along portions of public highways in that county. The American Equipping Co., of Kansas City, Kan., has the contract for building this road, the capital stock of which is \$250,000. C. F. Hutchings and Henry McGrew, of Kansas City, Kan., are interested. (March 31, p. 236.)

**LEWISTON, ME.**—An increase of the capital stock of the Lewiston, Brunswick & Bath St. Ry. was authorized by the Legislature before adjournment for the purpose of making improvements. H. M. Heath is Secretary.

**LYNCHBURG, VA.**—H. P. Woodson, C. V. Winfree, W. E. Graves and others have sold to the Lynchburg & Rivermont St. Ry. Co. the railroad from the intersection of Church and Twelfth Sts., to the passenger depot in the City Park, for \$19,500. This branch has just been completed and put in operation.

**MANKATO, MINN.**—The Mankato Electric St. Ry. Light & Power Co. was incorporated April 20, with a capital stock of \$100,000. The officers are: President, Leo S. Lamm; Vice-President, O. W. Schmidt; Secretary and Manager, S. Wilhartz; and Treasurer, C. J. Macbeth. The company proposes to build electric railroads in Mankato and surrounding towns. It cannot be said now how many miles will be built, but eight miles is first contemplated, and bids will probably be asked about June 1 for this work. Bids for rolling stock are wanted about the same time.

**M'KEESPORT, PA.**—The McKeesport, Buena Vista & West Newton Electric Ry., which is a continuation of the Versailles Traction Co., from McKeesport to Versailles, three miles south, will be in operation May 15.

**MAUCH CHUNK, PA.**—The Carbon County Electric Ry. Co. has been granted right of way through the Bloomingdale Valley to Summit Hill, near Lansford, where it will connect with the Lansford & Tamaque line, running to Tamaque.

**MEXICO CITY, MEXICO.**—A recent consular report, speaking of the change of power by street railroads in the City of Mexico, now operated by animal power and to be changed to electric, says there are about 300 miles of track in the district including the city. One short line of 1½ miles is called the "Banos" (for Baths) line. The rest belongs to the Compañia de Ferrocarriles del Distrito Federal. In December we mentioned the improvements being made. Until recently mules have been used. For communication with suburban towns the company has about 30 large cars supplied by J. G. Brill & Co., of Philadelphia, Pa. Arriving at the outskirts of the city the cars are coupled into trains of five or more cars, and are thence drawn at good speed by American dummy engines. The steam suburban lines will probably be retained and used chiefly for freight. The management is American, and the conductors and drivers are Mexicans. The franchises granted are about the same as in other cities. The capitalization is \$10,000,000. The street car fares vary according to distance. In the city proper they are 5 and 6 cents. Some of the suburban fares are as high as 30 cents.

**MILWAUKEE, WIS.**—Mayor Gorman, of Kenosha, has notified the Milwaukee, Racine & Kenosha Electric Ry. Co. that he will not recognize the franchise recently granted by the outgoing Council. (April



28, p. 306.) The company will not be able to complete its line from Kenosha to Waukegan this summer.

**MONTVILLE, CONN.**—The Montville St. Ry. Co., which has right of way for the entire proposed road of about 13 miles, has let additional contracts as follows: Grading to J. F. Shaw & Co., Boston; rails, Pennsylvania Steel Co., Steelton, Pa.; 14 cars, eight open and six closed, to Newburyport Car Mfg. Co. (March 31, p. 237.) Plans for a power house are not yet prepared. (April 28, p. 306.)

**NELSON, B. C.**—W. A. Macdonald has petitioned the City Council for a 35 year franchise for the British Electric Traction Co.

**OBION, TENN.**—We are informed that the Obion & Tiptonville Rapid Transit Co., which has a capital stock of \$100,000, is getting right of way for the proposed 30 miles of electric railroad which it has already located from Obion City on the Illinois Central RR., through Glass and Wilsonville to Tiptonville on the Mississippi River. Bids will be asked on the required rails, rolling stock and other material as soon as ten miles of the road have been graded. Only one small bridge across a creek will be necessary on the road. (March 18, 1898, p. 209.) The officers are: President, W. M. Wilson, of Obion; Vice-President, George Morris, Huntington; Secretary, T. J. Ogilvie, Obion; Treasurer, J. H. McDowell, Union City. Mr. Ogilvie is also Purchasing Agent. W. B. Southgate is Engineer.

**PARIS, TENN.**—The Paris Electric St. Ry. Co., which was organized in the early part of April, has been granted a charter by the State. The capital stock is \$100,000, and the incorporators are: John C. Sweeney, W. W. Parabough, W. A. Carter, H. B. Swinney, John R. Rison, Y. Q. Caldwell, J. M. Porter, J. C. Porter, C. P. Henderson, O. C. Barton, W. C. Johnson and F. M. Vancleave.

**PERTH AMBOY, N. J.**—The Perth Amboy RR. Co. has secured right of way for two lines, one from Perth Amboy to Metuchen, about four miles, and the other from Perth Amboy to Woodbridge, 5½ miles. Connection will be made with the Consolidated Traction Co. at Metuchen, and it is said that negotiations are in progress for a controlling interest in the P. A. RR. by the Consolidated. The absorption of the P. A. will give the Consolidated a through line to the Staten Island ferry. The officers of the Perth Amboy RR. Co. are: President, Leonard Lewisohn; Vice-President, C. J. Wittenberg; Secretary and Treasurer, J. C. McCoy. (Jan. 27, p. 74.)

**PORTLAND, ME.**—We are officially informed that with the purchase of the Portland & Cape Elizabeth Ry. Co. by the Portland RR. Co., the property will be greatly improved. The P. & C. E. will be operated as a part of the Portland RR. and about three-fourths of a mile of track will be built, connecting the two sections of the present track now operated. E. A. Newman, General Manager. (Feb. 24, p. 148.)

**POTTSTOWN, PA.**—The Pottstown Passenger Ry. Co. will build an extension of about four miles from Saratoga to Limerick Square, where it will connect with the proposed line of the Trappe & Limerick Square Electric Ry. Co., which was incorporated April 4.

**PROVIDENCE, R. I.**—On April 26 an act granting a franchise to the Providence & Woonsocket St. Ry. Co. was introduced in the Rhode Island Senate. The incorporators are John D. Turner, Saylesville; C. H. Staples and J. B. Carter, and the capital stock is fixed at \$500,000. The plan is to build a 20 mile line to connect with the branch line of the Woonsocket road at Manville, and to continue through the villages of Albion, Lonsdale and Saylesville and through Pawtucket and on to Providence. In case the Union RR. Co. has exclusive franchises in any of these places, endeavors will be made to arrange for travel over the lines of that company by lease. The act stipulates that the company must be organized before June 1, 1900, and the road be completed within one year.

**RENSSELAER, N. Y.**—The Greenbush & Nassau Electric Ry. has filed a certificate of extension with the Secretary of State, through private property in the counties of Columbia and Rensselaer, and will connect with the Kinderhook & Hudson RR. Philip H. Hanpson, President; L. B. Grant, Secretary.

**RICHMOND, VA.**—The Richmond & Petersburg Electric Ry. Co., the new company which proposes to build over the Petersburg Pike, has deposited the necessary bond of \$1,000 and work has already been begun on the road between Petersburg and Manchester. The right for an additional street railroad in Richmond will soon be granted and three companies, the Richmond Ry. & Electric Co., the Richmond Traction Co. and the Richmond & Petersburg Electric Ry. Co., are contesting for it.

**ROCHESTER, N. Y.**—According to report, engineers are surveying for an extension of the Rochester Ry. to connect Lewiston and Niagara Falls. The Cuyler-Morgan syndicate, who, it is reported, have secured control of this road, have also the right of way from Lewiston to Brockport.

**SARATOGA, N. Y.**—The Saratoga Northern Ry. has been granted a franchise and right of way through Maple, East and Spring avenues for a consideration of \$5,000, which will be used by the city to prepare the streets on which the road is built. The Berlin Iron Bridge Co. of East Berlin, Conn., has the contract for bridge work, and the cars have been ordered from Brill Bros. The General Electric Co. also has contracts. (April 7, p. 255.)

**SAVANNAH, Ga.**—The Suburban & West End RR. has a petition before the City Council asking that a committee be appointed to hear the company on operating its cars by compressed air. It has decided to adopt compressed air and desires franchises to make the improvements. (Feb. 24, p. 147.)

**SEATTLE, WASH.**—The trustees of the First Ave. Cable Co., through Geo. E. Macomber, have applied to the City Council for a 50-year franchise for an electric railroad. The company proposes to expend between \$65,000 and \$100,000 in changing the present cable road to an electric line. Fifty-six pound rails will be used and the road will be extended both north and south.

A. F. Haas, Superintendent of the company which recently secured franchises to build on Yesler Way and Jackson St., has petitioned the Board of Public Works for permission to start the work. Andrew F. Burleigh is also interested. (April 7, p. 255.)

**TACOMA, WASH.**—The Tacoma Ry. & Power Co. has been granted a franchise by the County Commissioners to build a single track electric railroad from Tacoma to American Lake, about 20 miles. The line must be in operation within one year. (April 7, p. 255.)

**TERRE HAUTE, IND.**—The promoters of the Brazil & Terre Haute Electric St. Ry., have petitioned the County Commissioners for right of way over the National road from Brazil west to the Vigo County line, having already secured right of way from that point through Vigo County. The Brazil Rapid Transit St. Ry. Co. also desires this franchise. The Vandavia Line now practically covers this territory and is to install motor cars on the 15 miles to meet the competition of the electric company. We speak of these cars in another column.

**VANCOUVER, B. C.**—We are officially informed that contracts have been let by the British Columbia Electric Ry. Co. for the two miles of electric road in Vancouver, and that work is begun. Orders have already been placed for two open and two closed motor cars. (March 3, p. 162.)

**WASHINGTON, D. C.**—T. Wm. Harris, President of the Washington & Gettysburg Ry. Co., has made application to open the necessary streets for the continuation of his road into the District, which will be built from the intersection of the boundary line to Fourteenth St., extending northeast to Tenth St., thence to Rhode Island Ave. (April 21, p. 290.)

The Capital Traction Co. proposes to build a terminal loop at the northern end of its Fourteenth St. line, and also to build a large passenger shed. This is the only company which is not included in the consolidation of the street railroads in Washington.

**WATERTOWN, N. Y.**—According to report, a contract has been let by the Black River Traction Co. to Thomas and J. D. Murray, of Brooklyn, N. Y., for the four-mile extension between Dexter and Brownsville, which has been in contemplation for some time. (July 29, 1898, p. 556.)

**WINTON, PA.**—We are informed that contracts will probably be let this fall for completing the six miles of proposed road by the Seymour Electric St. Ry. Co. The proposed equipment consists of three open and six closed motor cars. The officers are: President, James Bell; Vice-President, J. J. Walsh; Secretary, J. J. Cummings; Manager, Engineer and Purchasing Agent, W. G. Robertson; Attorney, Chas. P. O'Malley, of Scranton.

**YEADON, PA.**—The Midland Ry. Co., which last week was reported as having secured right of way through Yeagon, is organized as follows: President, James D. Laylor; Vice-President and Treasurer, J. W. Jackson; Secretary, Sidney M. Bink. E. G. Thompson and David R. Burns, with the above officers, constitute the Board of Directors. It is proposed to begin work within four months and to have the road completed within six months thereafter.

#### GENERAL RAILROAD NEWS.

**AUGUSTA SOUTHERN.**—Upon the order of Hon. E. L. Brinson, Judge of the Superior Court of Richmond County, Ga., the receivers on April 27 delivered this property to the South Carolina & Georgia. (Sept. 16, 1898, p. 679.) The road was placed in the hands of a temporary receiver July 20, 1898, and the receiver was later made permanent. (Official.)

**BALTIMORE & OHIO.**—A. S. Dunham and Arthur L. Spamer, Special Masters in the United States Circuit Court, submitted their report April 26, showing the total indebtedness of the company to be \$120,488,132, of which \$108,236,325 is mortgage liens, car trust funds and receiver's certificates. (March 31, p. 237.)

On May 15 a hearing will be given by Judge Morris in the United States Circuit Court at Baltimore, on the petition for permission to issue new stocks and bonds of this company, provided for under the reorganization. This is the final step in the rehabilitation of the company.

**BENNINGTON & RUTLAND.**—Superintendent E. Bennett was appointed receiver of this property on April 24. The road runs from Bennington, Vt., to Rutland, 57.06 miles, with a branch from North Bennington to White Creek, 1.85 miles. The capital stock is \$1,000,000 and the funded debt \$475,000.

**CAROLINA MIDLAND.**—The application for a receivership for this company, made by the Southern Investment Co., a minority stockholder, has been refused by the court. In our recent reference to this road it was stated by mistake that the line was 22 miles long. It is 54 miles in length, extending from Allendale, S. C., to Seivern. (April 7, p. 255.)

**CENTRAL OF NEW JERSEY.**—On May 10 stockholders of record will be offered the privilege of subscribing at par for \$4,503,800 new stock to the amount of one new share for each five old shares held. The proceeds will be used to retire \$3,836,000 7% consolidated mortgage of the parent company, due July 1, 1899; \$411,000 New Jersey Southern first mortgage 6%, due July 15, 1899, and \$197,000 Long Branch & Seashore first mortgage 7%, due Dec. 1, 1899. The \$4,444,000 bonds so retired represent an aggregate interest of \$360,970 per annum. With the new issue, the stock will aggregate \$27,022,800.

**CENTRAL OHIO.**—At the annual meeting, held at Columbus, O., April 26, it was announced that a majority of the stockholders had assented to the B. & O. reorganization plan, and the property will be turned over to that company. (Nov. 4, 1898, p. 805.)

**CENTRAL VERMONT.**—The receivers turned over the property of this company to the corporation at 12 o'clock midnight, April 30. It was sold under foreclosure at St. Albans, Vt., March 31, to the bondholders' committee. The receivers were appointed March 19, 1896. (April 7, p. 255.)

**CLEVELAND, CINCINNATI, CHICAGO & ST. LOUIS.**—The first mortgage sinking fund 7% bonds of the Cleveland, Columbus, Cincinnati & Indianapolis, maturing May 1, will be paid, on and after that date, upon presentation at the office of J. P. Morgan & Co., New York.

**FLORIDA CENTRAL & PENINSULAR.**—President Duval has issued a circular announcing that the

offer of \$50 for preferred, and \$16 for common stock, made by the syndicate which controls the Seaboard Air Line, is now effective, and that the option expires June 1. (March 10, p. 182.)

The syndicate last week paid \$3,496,600 as settlement in full for a majority of the shares of the company, and the minor stock is being paid for as fast as presented at the Produce Exchange Trust Co.

**GAINESVILLE & GULF.**—The company has made a mortgage to the Standard Trust Co., New York, as trustee, to secure bonds for \$150,000 to pay off the indebtedness of the company and to make an extension to Sampson City.

**GALVESTON, HOUSTON & NORTHERN.**—The Texas RR. Commission has voted favorably on the application of this company, successor to the Galveston, LaPorte & Houston, to issue \$1,000,000 of bonds. (April 7, p. 255.)

**GREAT NORTHERN.**—The new issue of \$7,500,000 stock for the Eastern of Minnesota (April 28, p. 307), is officially stated for the following purposes:

(1) To acquire the stocks and bonds of the Duluth, Superior & Western Ry. Co., and to pay for the railway and properties purchased by this company from the Duluth, Superior & Western Ry. Co.

(2) To acquire the railway, appurtenances and rights of the Duluth, Mississippi River & Northern Ry. Co.

(3) To obtain the means of constructing, completing and equipping an additional line of railway from a point near Coon Creek to Sandstone, in the State of Minnesota.

(4) To pay for the construction, completion and equipment of this company's line between Lake Superior and Fosston.

(5) To pay for the acquisition of additional equipment and for the acquisition and construction of additional facilities at this company's Lake Superior terminals and elsewhere on its system.

(6) To acquire \$500,000 of the mortgage bonds of the Duluth, Superior & Western Terminal Co.

(7) To acquire \$500,000 of the mortgage bonds and \$500,000 of the capital stock of the Park Rapids & Leech Lake Ry. Co.

**GREAT NORTHWEST CENTRAL.**—T. G. Shaughnessy, Vice-President of the Canadian Pacific, and associates, are reported to have bought the Great Northwest Central, which runs from the C. P. R. at Chater, Manitoba, west to Hamiota, 60.93 miles. The entire line as projected is from Brandon west 450 miles to Battleford.

**GURLEY & PAINT ROCK VALLEY.**—This company's property will be sold under mortgage at Huntsville, Ala., May 22. It was incorporated in 1889, with a capital stock of \$100,000, to run from Fort Deposit, on the Tennessee River, north 60 miles up Flint River Valley to Gurley and thence to Winchester, Tenn. About five miles of track was laid in 1892 and the work then abandoned. Efforts have recently been made to revive the project. (Railroad Construction column, April 21, p. 239.)

**HOCKING VALLEY.**—The New York Stock Exchange has listed for this company \$7,200,000 of first mortgage 100 year 4½% gold bonds of 1899, \$10,000,000 preferred stock, and \$6,000,000 common stock; also \$1,401,000 Columbus & Hocking Valley first mortgage extended 4% gold coupon bonds of 1948. The principal office is at Columbus, O. The fiscal and transfer agents are J. P. Morgan & Co., New York. (April 14, p. 274.)

**HOUSTON EAST & WEST TEXAS.**—The bill to consolidate the Houston & Shreveport with this company has passed the Texas Legislature and is signed by the Governor. The Houston & Shreveport line was originally part of the H. E. & W. T., and is operated with the parent company as one road.

**JACKSONVILLE, TAMPA & KEY WEST.**—The main line, with the branches to Enterprise and DeLand, Fla., which was sold to the Plant Investment Co., April 3, was taken possession of by the Plant system April 22 at 11:59 P. M., and the jurisdiction of all heads of departments of the system is extended over the property. (Official.)

**KANSAS CITY, PITTSBURGH & GULF.**—In the United States Circuit Court at Kansas City, Mo., April 27, J. McD. Trimble, General Counsel of the Company and one of the recently appointed receivers, offered his resignation as receiver and withdrew the motion to have the receivership case remanded to the State Court. Thereupon Judges Thayer and Phillips appointed Webster Withers of Kansas City, and S. W. Fordyce new receivers, and ordered that Robert Gillman be retained as General Manager of the property. This places the property in the hands of the Federal Court instead of the State Court, and the readjustment committee announces that the work of reorganization will be pushed vigorously by the committee. (April 28, p. 307.)

**MINNEAPOLIS & ST. LOUIS.**—This company on June 1 will retire all its first preferred stock, amounting to \$2,500,000. Redmond, Kerr & Co. of New York have bought \$2,500,000 first and refunding 4% bonds, and the stock will be paid off at their office.

**MISSOURI MIDLAND.**—The stockholders will vote May 6 on the proposition to issue \$142,000 of first mortgage bonds to build this line from Columbia, Mo., to Huntsdale on the Missouri, Kansas & Texas, nine miles. Chas. Wiggins of St. Louis, Mo., is President. (See Railroad Construction column.)

**NEW YORK CENTRAL & HUDSON RIVER.**—The Fall Brook, with its leased lines, the Syracuse, Geneva & Corning and the Pine Creek, was taken over by the New York Central May 1 and the jurisdiction of the general officers extended over it. (April 28, p. 307.)

**NORTHERN ALABAMA.**—The sale of this property to the Southern has been consummated. The line runs through Sheffield, Ala., to Parrish, 95.5 miles, with several branches aggregating 23.11 miles. (Dec. 16, 1898, p. 906.)

**NORTHWESTERN COAL.**—President Hill, of the Great Northern, according to report, has bought this line running from Allouez Bay, Wis., to the St. Louis River, on the Minnesota state line, 12.82 miles. The line runs into the cities of Duluth and Superior and includes the Superior Belt Line & Terminal.

**OHIO SOUTHERN.**—Receiver's certificates authorized under orders filed Feb. 13 and Oct. 7, 1897, and



Jan. 22, 1898, will be paid at the Central Trust Co., New York, interest to cease May 1. (March 10, p. 182.)

**PENNSYLVANIA.**—The company has sold to Speyer & Co., \$3,000,000 of 3½% equipment bonds, re-payable in 10% annual installments, beginning in 1900.

**RICHMOND & MECKLENBURG.**—This property, heretofore operated under a temporary agreement by the Southern Ry., has been taken over by a lease dated Nov. 1, 1898. A plan is operative to refund the \$315,000 first mortgage 6% bonds of the R. & M. into new 4% bonds, and the exchange, it is said, will be made shortly.

**RICHMOND, NICHOLASVILLE, IRVINE & BEATTYVILLE.**—This road was sold at public auction at Versailles, Ky., May 2, to Adolph Segal of Philadelphia, for \$231,000. Mr. Segal bought the road in 1897, but failed to make the required payments and the sale was again ordered. (April 7, p. 255.)

**SOUTH CAROLINA & GEORGIA.**—Samuel Spencer, President of the Southern, has announced the lease of this property by his company, possession being taken April 29. The S. C. & G. operates 328.83 miles, has a capital stock of \$5,000,000 and a funded debt of \$5,250,000.

The stockholders of the S. C. & G. on the same date refused to guarantee the proposed issue of \$1,800,000 4½% per cent. gold bonds, to be issued by the South Carolina & Georgia extension or to ratify any contract heretofore made with the latter company. (April 7, p. 236.)

**TRANSYLVANIA.**—This company has been incorporated in North Carolina as successor to the Hendersonville & Brevard, which extends from Hendersonville, N. C., west 21.6 miles to Brevard. The property was recently sold to the Toxaway Co., which, according to report, is to extend it about 12 miles further southwest to Easteloe. (April 21, p. 291.)

**WHEELING & LAKE ERIE.**—The Wheeling & Lake Erie (railroad instead of railway) was incorporated in Ohio April 29, with a capital stock of \$2,450,000, as successor to the old company, whose property was sold at foreclosure at Toledo, O., Feb. 7 to the reorganization committee. The officers of this new company are given under Elections and Appointments.

The reorganization committee is prepared to deliver at the offices of the Mercantile Trust Co., New York, the securities of the new company in exchange for Mercantile Trust Company's certificates of deposit for consolidated 4% mortgage bonds of the old company, and for Central Trust Company's certificates representing the preferred and common stock.

**WISCONSIN CENTRAL.**—A meeting of holders of certificates of deposit of the Old Colony Trust Co. for income 5% gold bonds, and for preferred and common stock, is called at the Old Colony Trust Co., Boston, at 2 p. m., May 9, to vote on the reorganization plan recently announced. The plan has been accepted by the reorganization committee, subject to this approval. (April 21, p. 291.)

At a meeting of bondholders, held at Chicago, May 2, the proposed reorganization plan was adopted.

#### Electric Railroad News.

**ATTLEBORO, MASS.**—The Attleboro & Norton Electric Ry., the Norton & Taunton Ry., the Mansfield & Norton and the Eastern & Mansfield Electric Ry., have been consolidated and a new company will soon be organized.

**BROOKLYN, N. Y.**—The Brooklyn Rapid Transit Co. has reached an agreement with P. H. Flynn, which includes not only the withdrawal of the suits that were pending, but the acquisition of the Flynn holdings of stock, securities, rights and franchises in the Brooklyn City, the Nassau Electric, the Coney Island & Brooklyn, the Brooklyn Elevated roads, and also the Gravesend & Coney Island road. A new system of through express from the Manhattan terminal to Coney Island, and from the Broadway ferry to Rockaway Beach via the elevated railroad lines, was inaugurated April 20, and an average of 12,000 passengers an hour were carried. The Brighton Beach road will be equipped with electricity up to the Kings County Elevated structure by May 30. The Fifth Ave. section of the Brooklyn Elevated will also be equipped electrically by Decoration Day.

**CLEVELAND, O.**—Mr. R. M. Douglass, formerly General Manager, Secretary and Treasurer of the Schuylkill Valley Traction Co., of Norristown, Pa., has been appointed General Manager of the Cleveland Electric Ry., otherwise known as the "Big Consolidated." He will have charge of all property, including power house, track, cars, etc., relieving President H. A. Everett of all the routine work that he has been carrying on since the purchase.

**EXETER, N. H.**—Steps have been taken for the consolidation of the Exeter St. Ry. Co., the Rockingham Electric Co., and the Hampton & Amesbury St. Ry. Co., into the Exeter, Hampton & Amesbury St. Ry. Co., recently incorporated for this purpose. Warren Brown, of Hampton Falls; Wm. Burlingame, Eben Folsom and Rufus N. Elwell, of Exeter; Wallace D. Lovell and Chas. E. Hollander, of Boston, and Albert E. McReel, of Exeter, have been chosen directors of the new company, with Mr. Brown as President; Mr. Hollander, Treasurer; Harry D. Stone, Exeter, Assistant Treasurer. (March 3, p. 164.)

**GALVESTON, TEX.**—A petition has been presented to the City Council, which authorizes the consolidation of the Galveston City RR., and the Gulf City St. Ry. & Real Estate Co., which is now operated by the Galveston City RR. A new franchise for 25 years is also asked. The foreclosure sale of the Galveston City RR. is set for Sept. 5. (March 31, p. 238.)

**MOLINE, ILL.**—The stockholders of the Moline Central St. Ry. have voted to sell the property to the Tri-City Ry. for \$64,000. The M. C., which is five miles long, is capitalized at \$100,000, of which \$32,000 is outstanding. The property is mortgaged for \$48,000. The road ceased operations some time ago. The Tri-City Ry. was recently granted a 25-year franchise on condition that it purchase the M. C.

**NASHVILLE, TENN.**—The Nashville Ry. has been incorporated by E. C. Lewis, A. H. Robinson, J. C. Bradford and Wm. Hunt, all of Nashville, with a capital stock of \$6,500,000, for the reorganization of the Nashville St. Ry., and the Cumberland Electric Light & Power Co., recently bought by Hambleton & Co. Reports state that they also hold an option on the Nashville & Suburban, which was built in 1897, and known as the Overland Ry., and later operated by the Nashville Traction Co.

The Citizens' Rapid Transit Co., which is also included in this consolidation, was organized nine years ago, and operates about nine miles of road. T. M. Steger is President. The company has a bonded indebtedness of \$60,000.

**NEW ORLEANS, LA.**—The stockholders of the New Orleans & Lake Ry. Co., at a recent meeting adopted the plan for the exchange of their present holdings for those of the New Orleans City RR. Co., the new company under the reorganization. The new securities will probably be ready June 1. (March 17, p. 200.)

**NEWPORT, R. I.**—The Shaw Syndicate, which about two weeks ago secured controlling interest in the Newport Illuminating Co., and the Newport St. Ry., is reported to have also secured controlling interest in the Newport & Fall River St. Ry. Edward P. Shaw, Jr., is a director in the latter company.

**NIAGARA FALLS, N. Y.**—The Niagara Falls & Lewiston RR. will be sold under foreclosure of a mortgage of \$1,000,000, of which the Knickerbocker Trust Co. is trustee. Default has been made in four quarterly payments. The road has been in the hands of Joseph R. Megrue for several months as temporary receiver. (Feb. 24, p. 148.)

**NORFOLK, VA.**—The Norfolk, Willoughby Spit & Old Point Electric RR., which was leased in 1898 for five years to the Norfolk & Ocean View Ry., was, on May 1, sold to R. Lancaster Williams, President of the N. & O. V. The price is said to be about \$100,000. Mr. Williams will be President, and Frank O. Briggs Vice-President.

**NORRISTOWN, PA.**—A. G. Davis, heretofore Superintendent of the Schuylkill Valley Traction Co., has been appointed Manager, succeeding R. L. Douglass, whose resignation was noted last week. J. H. Bucher succeeds Mr. Douglass as Secretary and Treasurer. The company is about undergoing reorganization. Local men are to control the property under N. H. Larzelere, of Norristown, who will become President, and H. C. Jones, of Conshohocken, who will be Secretary and Treasurer.

**ROCHESTER, N. Y.**—Ira M. Luddington, Superintendent of the Ironquoit & Lake Shore Electric RR., and also Manager of the Rochester & Sodus Bay Ry. Co., and of the Summerville Ferry, has resigned these positions, his resignation taking effect May 1. He will engage in railroad contracting, and it is said that he has already a contract on the Lehigh Valley, near Caledonia. Chas. A. Williams, present Auditor, succeeds Mr. Luddington as Superintendent.

**SANTA CRUZ, CAL.**—J. Philip Smith, of the Santa Cruz Electric Ry., is said to be negotiating for the sale of that company, which operates eight miles of electric road, to the Huntington syndicate, in the interest of the Southern Pacific. The Huntington syndicate now operates electric street railroads in San Francisco, Oakland and Los Angeles. The S. C. E. Ry. will probably be extended nine miles northwest of Santa Cruz to mines near the coast.

**SYRACUSE, N. Y.**—The tracks of the Syracuse Rapid Transit Co., which were torn up by citizens a week ago last Friday, have been relaid. The company secured an injunction preventing further interference, but city officials and citizens obtained another injunction restraining the company from using the relaid tracks.

**WASHINGTON, D. C.**—The Washington Gas Co. is reported sold to Frederick C. Stevens, to be included in the consolidation of the power and traction companies of Washington.

**WILKESBARRE, PA.**—Negotiations are reported completed for the sale of the Wilkesbarre & Wyoming Valley Traction Co. to Brown Bros. & Co., of New York, at \$41 a share. The W. & W. V. is capitalized at \$5,000,000, and controls all (about 14) the street railroads in the Wyoming Valley, extending from Wilkesbarre to Duryea, on the north and Nanticoke on the south and east side of the Susquehanna, and to Pittston north and Plymouth south on the west side of the river. The road comprises 63.10 miles of track. The annual report for the year ended Dec. 31, 1898, gave the gross earnings as \$506,747 and net \$286,844. It is said that Brown Bros. & Co. are also negotiating for the control of the Carbondale Traction Co., operating 20 miles of road and controlling all roads in that city and vicinity, and also for the Scranton Ry., which owns and operates all the street roads in Scranton, and has an aggregate mileage of 55 miles. The company is a consolidation of five other companies, and the road reaches Carbondale on the north and Pittston on the south.

#### TRAFFIC.

##### Traffic Notes.

F. H. Peavey & Co. are to build a grain elevator at Duluth to hold 5,000,000 bushels.

The Texas & Pacific has given notice of withdrawal from the Southwestern Passenger Bureau.

On April 24 the Interstate Commerce Commission held a hearing at Danville, Va., on the petition of that city for lower rates over the Southern and the Atlantic & Danville railroads.

The Interstate Commerce Commissioners have invited the presidents of the railroads south of the Ohio River and east of the Mississippi to meet them at Washington on May 10. The invitation has also been sent to roads west of the Mississippi, which are interested in the export grain traffic.

It is reported that the Baltimore & Ohio will hereafter give stopovers at Baltimore out through tickets between New York and the West. This is a privilege which the Merchants and Manufacturers' Association of Baltimore has persistently demanded for 15 years. The Baltimore & Ohio has now availed itself of the

opportunity for independent action and has granted what was asked for.

The presidents of the Trunk Lines and their Western connections held a meeting in New York last week, and it seems to have been decided by a strong majority that nothing should be done toward continuing or restoring the Joint Traffic Association in any shape. The former members of the Board of Managers of the Association still constitute a committee to perform the functions apparently of a conference committee on rates, but it does not appear that they have taken any action.

Mr. Milton H. Smith, President of the Louisville & Nashville, whose views concerning the Interstate Commerce Commission were mentioned by Chairman Knapp in a newspaper interview, which was copied in the Railroad Gazette of April 21, has sent to Leonard's Railway News a two-column reply to Mr. Knapp. The reply deals with the phraseology and meaning of the Interstate Commerce Law, of the amendment to this law proposed by the Commission, and of the Supreme Court decisions under which the law must now be interpreted. The arguments are similar to those of Mr. Smith and General Duke heretofore published in the Railroad Gazette.

##### Midnight Tariffs in Texas.

The Texas Railroad Commissioners have given the railroads a piece of their mind, in a circular to the general freight agents which reads as follows:

The spasmodic lowering and raising of freight rates on interstate shipments to Texas common points from St. Louis, New Orleans and other commercial centers, is the greatest disturbing element with which we as a commission have to deal. Rate wars are admitted by all to be very demoralizing and injurious alike to the railway companies and business of the country. Stability of rates, above all things, is demanded by the business men and people of Texas, and this they would have but for the frequent cutting and slashing of rates on interstate shipments which are intended and in effect do redound to the interest of a few outside merchants without a corresponding benefit to the consumers of the goods in Texas.

The very fact that these cut rates are more frequent than ever, and are limited to a life of but ten days, as in the case of the binding twine cut rate, to meet which we have been compelled to put in emergency rates, shows most conclusively that the object of the cut rate is to serve a favored few and not the public generally, and in order that the damage caused by these cut rates may to some extent be repaired, this commission ought to, and will hereafter, allow its emergency rates to remain in force a sufficient length of time, after the expiration of the time named for the life of the cut rate, to enable our people, to some extent, to receive like benefits in disposing of goods shipped in at the regular rates.

##### Chicago Traffic Matters.

Chicago, May 3, 1899.

The fight over the stock yards switching charge has been renewed. In the United States District Court Judge Kohlsaat is hearing arguments for the granting of an injunction to restrain the railroads from collecting \$2 for switching on each car of live stock delivered at the yards. Some time ago United States District Attorney Bethea applied for a restraining order to carry out the Interstate Commerce Commission's ruling that the charge was unreasonable. The railroad companies demurred to the proceeding and arguments on the merits of the prayer are now being heard. The stock men have engaged a long array of legal lights and intend to make a strong fight. The railroad companies are contesting the case bitterly. None of the railroads reach the stock yards over their own tracks and claim that their live stock rates end with the end of their lines.

General passenger agents of the roads west of Chicago are still in session in this city, endeavoring to reorganize the Western Passenger Association, independent of the one or two trans-Missouri roads that still refuse to become members of any organization governed east of that river. A new agreement has been fixed up and regulations for its enforcement are now being considered.

It develops that the fate of the Western Trunk Line Committee really depends upon the Interstate Commerce Commission. At a recent meeting of the executive freight officers of the roads members of this organization, it was agreed to continue the committee until July 1. In the meantime there will be two joint conferences between the presidents of the western roads and the members of the commission, and upon the result of these conferences depends the life of the trunk line committee. In other words, the railroad representatives will pursue whatever course the commission may recommend regarding associations.

Freight rates in the territory west of this city continue firm. East of here they are not in such a good condition, though the weakness is not extreme. Passenger rates in the west are in bad shape, while east they are only a trifle better.

A joint conference between the passenger officers of the roads of the Central Traffic and Trunk Line associations will be held in this city to-morrow to consider a proposition to extend the Grand Army rates for this year from Philadelphia to New York. This is to be done by adding a round trip arbitrary of \$4 to the agreed rates.

Eastbound shipments of flour, grain and provisions from Chicago and Chicago junctions to and beyond the western termini of the trunk lines for the four weeks ending April 29, amounted to 378,970 tons, as compared with 295,830 tons for the corresponding period of last year. This statement includes 72,020 tons of flour, 250,376 tons of grain, and 56,595 tons of provisions. The following table shows the quantities and proportions carried by the respective roads:

Baltimore & Ohio.....	42,452	11.2
Cleveland, Cincinnati, Chicago & St. Louis..	4,074	0.1
Chicago & Erie.....	28,202	7.2
Grand Trunk.....	37,152	10.
Lake Shore & Michigan Southern.....	92,063	27.1
Michigan Central.....	34,425	9.
New York, Chicago & St. Louis.....	42,055	11.
Pittsburgh, Cincinnati, Chicago & St. Louis.	40,983	10.1
Pittsburgh, Ft. Wayne & Chicago.....	39,712	10.
Wabash.....	20,172	4.2
Totals.....	378,970	100.

Eastbound shipments from Chicago, as reported weekly by the Board of Trade were, for the four weeks ending April 29, 345,428 tons, as compared with 346,401 tons for the corresponding period of last year. This total of 345,428 tons is made up of 48,295 tons of flour and mill stuffs, 173,102 tons of grain, 47,606 tons of provisions, 34,324 tons of dressed beef, and 42,101 tons of miscellaneous freight.